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ADDRESSES AND ORIGINAL ARTICLES

ENLARGEMENT OF THE HEART *

BY JOHN PARKINSON, M.D., F.R.C.P. Lond.

PHYSICIAN TO THE CARDIAC DEPARTMENT OF THE LONDON HOSPITAL; PHYSICIAN TO THE NATIONAL HOSPITAL FOR DISEASES OF THE HEART

ENLARGEMENT of the heart touches so many problems in cardiology that it will be impossible to do more than refer to a number of them in two lectures, and it will be necessary to exercise a preference for problems which have come under my own notice. My plan is to take first the methods of examination; then the normal heart and its displacements and fixations; and lastly to speak of dilatation and hypertrophy in general. In the second lecture my main thesis will be that enlargement of the several components of the heart can now be identified by radiology and that it is no longer sufficient to speak of general enlargement alone. There are cardiac affections, notably angina pectoris, where the heart is commonly of normal size and shape; but usually, and often from its beginning, a cardiac lesion is associated with enlargement. For concise information on the history of cardiac enlargement and its physical signs, I would naturally refer you to the Harveian Oration of 1928, by our true knight of learning Sir Humphry Rolleston.[91]

Methods of Studying Cardiac Enlargement

THE PERCUSSION METHOD

For 175 years the clinical method of percussion has been in use; in general changing little, though variations in its application have been many. Throughout the relative values of light and heavy percussion in mapping superficial and deep areas of cardiac dullness have been disputed, and not yet has agreement been reached. Such a subjective method must yield a diversity of individual convictions on the correct method of its performance. It is no surprise to find that the area of normal cardiac dullness varies considerably with the authority on clinical methods. Indeed, as a rebuke to dogmatism, these were once collected by Moritz and superimposed to display the varieties of cardiac outlines favoured by famous authorities.[35]

The difficulties inherent in percussion have been glossed over in an amazing way. The stout and the emphysematous are admittedly exempt. A method which disfranchises a majority of women because of their mammary development belongs to the last century and presses for its relegation to that pre-X ray period. The nipple line in men is fairly constant and an indispensable guide, but the mid-clavicular line is difficult to apply and especially in women; it is exact enough at the clavicle, but nothing less than a plumb-line will give it exactness near the apex-beat where we need to use it. Surely it is better to measure outwards from the midline to the apex, and in men to use the nipple line in confirming the position of the apex-beat, an accessory to percussion by no means negligible.

The personal factor in such a subjective method as percussion is enormous and most authorities have felt it incumbent upon them to warn us of the fact. Students, from my time to this, find it almost impossible to avoid percussing preconceived or dictated ideas into the cardiac outline. They have now ceased to retain the requisite faith in cardiac percussion, and begin to resent the continued insistence on its values in certain quarters. Surely the time has come to revise our opinion of this primitive expedient which has outgrown its usefulness, and to require in the candidate some working knowledge of the radiological method as applied to disease of the heart and great vessels.

The inaccuracy of percussion is inseparable from a method which is indirect and inferential; and this is now generally admitted. No longer shall we tell of the professor who by knocking at the front door could find out who was in the drawing-room. Taking only the right limit of cardiac dullness, Samuel Gee says "in truth . . . not very trustworthy." [82] The transverse diameter on percussion over the convex surface of the chest is in excess of the real transverse diameter on orthodiagraphic projection, and the discrepancy grows when a heart is much enlarged.

The limitations of percussion in cardiac mensuration are best exposed by furnishing examples of the potentialities of X rays. This I hope to show. The need for supporting evidence on enlargement is testified by the increased reliance placed in recent years upon the position of the apex-beat. This is all to the good of diagnosis, and a healthy sign of discontent with percussion methods; but although the apex-beat gives good information about the left border of the heart,[108] it is misleading where there is displacement from any cause. Besides, the apex-beat is not always palpable, and it may seem to be farther out than it really is when there is tachycardia. Moreover, it is now rightly claimed that enlargement of the left ventricle may be assumed if there is clinical evidence of continued hypertension or of aortic incompetence, and that similarly the right auricle will be enlarged if there is distension of the veins of the neck with other signs of congestive heart failure. Thus there is ample scope for thorough clinical observation as a contributory means of inferring or even postulating enlargement.

As a final effort to resuscitate a dying method which is packed with fallacies and imperfections, there have been attempts to square the results of percussion with those of radiology, but they have led to nothing. Percussion had to serve in the past, and it may still serve as a crude expedient in certain cases, but the best proof that it is to be extruded from our important and growing number of clinical and laboratory methods is the fact that it is sterile. The tokens of sterility are upon it. Nothing has been added to medical knowledge or progress through cardiac percussion since the beginning of this century, and in the light of X rays it will shrink into obsolescence.

THE RADIOLOGICAL METHOD

It was at the close of the last century that X rays were discovered, and their application to the heart was not long delayed. This can well be judged from the remarkable amount of information on the subject of radiology of the thoracic organs to be found in Holzknecht's book [49] published so long ago as 1901. Radioscopy (or fluoroscopy) was used, as well as radiography, though there was a time when they fell largely into disuse owing to fear of X ray effects on the operator. Happily these are now avoidable and avoided. No organ is so well placed for X ray inspection as the heart. It is surrounded by translucent lung, and by rotation of the patient it can be viewed from every angle. Instead of the outline of a cardiac

* The first Lumleian lecture for 1936 delivered before the Royal College of Physicians of London on March 17th. The second lecture will appear in THE LANCET next week.

superficies obtained mediately by percussion, we see immediately the volume of the heart and the totality of its vascular extensions; and meantime we are watching the contractions of its constituent parts. Here is no single avenue of approach but approach from open country on all sides. We obtain the composite picture of a sum of cardiac aspects, a system of perspectives. X rays tell us literally everything that percussion can tell us and tell it more amply and precisely. "More faithful witnesses are eyes than ears." Its scope goes far beyond the dreams of the past masters or artists of percussion. The superiority and clinical worth of radiology is indisputable; it is as useful as the electrocardiograph and a necessary complement to it. We should be quite indifferent whether it is to be classed as clinical or laboratory, classical or modern, if only it implements our inquiries and facilitates a comprehensive and accurate diagnosis. It cannot or ought not now to be said that it is not readily available; it is available for a trivial surgical or dental defect, so why not to reveal a heart in its fullness?

The chief objection appears to be the fear of restricting the medical student's training in physical methods of a literally handy sort. Training in observation is without doubt an integral and all-important thing; but the more would this be advantaged were it concentrated on inspection, palpation, and auscultation, and were percussion derogated in favour of a more effective X ray inspection. It is as if we lamented the employment of the sphygmomanometer because less stress need now be laid on judgment of tension by feeling the pulse. It has always been permitted to teach students our disbeliefs as well as our beliefs.

The Normal Heart Size: Cardiometry

By an enlarged heart, in the clinical sense, is meant a heart which has exceeded the physiological limits of size. It follows that in deciding the question of enlargement, it is of some importance to know what the physiological limits of size are. We may express the absolute size of the heart in terms of weight or volume, but neither can be measured directly during life. Anatomical data are available [102 7] which show that the weight of the heart in health varies within wide limits, but keeps parallel with body-weight. Thus, if the mean heart-weight in men is taken as 300 g., the average heart-weight varies between 215 and 392 g. for body-weights of 50 to 90 kg.—i.e., it almost doubles its weight (Smith). There is no direct relation between heart-weight and stature, nor, according to Smith, between heart-weight and age, as used to be thought. What we require for clinical purposes is not the absolute heart size, but the heart size in relation to bodily size. In radiology, the main difficulty lies in the impossibility of measuring directly the volume of the heart. A measurement made in a single plane such as the width of the heart—i.e., transverse diameter—is no true index of heart volume because the transverse diameter (T.D.) is so much influenced by the position and inclination of the heart in the chest. Thus a short thickset man will have a wider T.D. than a tall slender man of similar body-weight and presumably of similar heart-weight.

The average transverse diameter in healthy adults (orthodiagram in erect posture) varies from 10 to 12·5 cm. according to body-weight, but in any given weight group the maximum and minimum values may differ by several centimetres. The transverse diameter has a limited use to express the full width of the heart shadow in a given patient, and for comparative measurement in the same patient. Similarly the cardiothoracic ratio—the ratio between the transverse diameter of the heart and the internal diameter of the chest at its base—does often approximate to a figure of 50 per cent. in health, but it is unsafe as a guide to whether a heart is slightly enlarged or not.

The investigations of Bedford and Treadgold [9] in this country and of Eyster and others in America have shown that the cardiac transverse diameter can be more closely correlated with bodily size if height as well as weight is taken into account. The tables constructed by Hodges and Eyster [47] for predicting transverse diameter (or area) from weight and height probably represent the most scientific method of deciding the physiological mean heart size for any given person. Attempts have even been made to estimate the cardiac volume from measurements made in two planes, and Rohrer's method [90] as confirmed and amplified by Kahlstorf [58] appears to give reasonably accurate results.

Cardiometry is so complicated, and so full of pitfalls, that it is scarcely adapted to routine clinical use, though it will always be needed for comparative measurements in the same person and for research purposes. Meanwhile one can form a sound opinion of heart size from simple screen examination without measurements, for radioscopy has the advantage of permitting inspection of the heart from every angle, and estimation by the eye of its size in various planes.

The Position of the Heart and its Displacement

The position of the normal heart in the chest varies within wide limits. In general it is expected that about one-third of the projected cardiac area lies to the right of the midline of the body, and two-thirds to the left of it. The heart is moored at its base by the great vessels entering and leaving it—i.e., by the venous mesocardium and the arterial mesocardium (Keith). This fact is well appreciated when the pericardium is opened and the hand grips and moves the heart about on the universal joint formed by the vascular attachments, especially the pulmonary veins, which have to be severed before greater movement is possible. Section of the aorta, venæ cavæ, and pulmonary artery then allows complete excision of the heart. This fixation especially to the pulmonary vessels reminds us of Keith's dictum that "the lungs in all their movements carry their pump with them" [55] Further, that other respiratory organ, the diaphragm, is seen to be of prime importance in deciding the lie of the heart. The axis of the heart may be found at almost any angle between horizontal and vertical. The right ventricle rests lightly on the diaphragm, and the distended lungs keep the heart in place. Any change in position of the heart with respiration has a profound effect on the projected outline of the heart as seen by radioscopy. The heart is no simple geometrical figure, but an irregular cone with its apex passing forwards and downwards to the left. It is this complicated solid, of which we see by radioscopy a silhouette—a section at its greatest diameter in the coronal plane. No wonder there are such variations in the size and shape of the projected outline; indeed, their extent has provoked a certain pessimism in those ambitious for precision in the measurement of an organ so visually accessible as the heart.

The *diaphragm* appears to be the greatest factor in deciding the position of the heart in health (Fig. 1). The short stout individual with a short wide chest and high diaphragm has a heart tilted upwards and

to the left; the tall thin individual with a long narrow chest and a low diaphragm has a heart swung in towards the middle line. The heart of the one looks large and horizontal; of the other small and vertical. Rotation of the heart on its own axis may also be operative, certainly it can be in mitral stenosis. Consideration of the big difference between the position, shape, and apparent size of the heart in deep inspiration and in expiration will leave no doubt that a substantial variation in shape and apparent size is to be expected in health.[26] There are also distinct differences between records obtained with the subject in the horizontal and in the vertical position, again dependent partly upon the diaphragm; but observations are now usually made with the patient standing or sitting, and rightly so for the comfort of a cardiac patient.

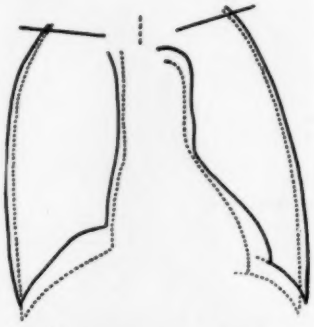

FIG. 1.—Displacement of heart upwards and to the left. Pregnancy, ninth month (continuous line); two months later (dotted line).

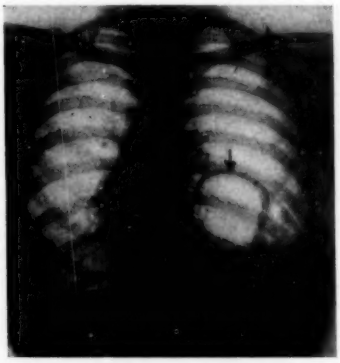

FIG. 2.—Displacement of heart to right by high position (eventration) of the diaphragm.

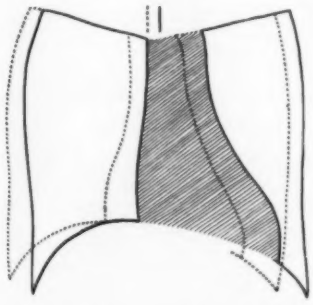

FIG. 3.—Displacement of heart to the left by right dorsal scoliosis (shaded portion). Corrected by rotation 10° to the right (dotted line).

In children the diaphragm is relatively high, and the heart looks proportionately large and rounded in a relatively small chest. The manubrio-xiphoid junction is a useful guide to the natural level of the top of the diaphragm in the neutral phase.[6]

The diaphragm is placed high whenever there is undue distension of the abdomen as in obesity or ascites. Then with gas inflating the stomach or colon, it is especially the left dome of the diaphragm which rises like a recording gauge as it carries with it the heart. The usual displacement is upwards and outwards so that the heart seems larger. A less usual displacement, towards the right side, may be produced by a large diaphragmatic hernia. Different in pathology, and less rare, is the eventration or high position (or elevation) of the left dome of the diaphragm which is encountered now and then on routine radioscopy of the heart. The dome is not broken, and it moves with respiration (and not always badly), but the differentiation from unilateral paralysis or even from true hernia of the diaphragm may require all the technical skill of a radiologist. I have seen this condition with cardiac displacement to the right (Fig. 2), with and without symptoms. As in the common condition of a normal diaphragm with much gas in stomach or colon below it, I find the patient, strangely enough, often denying any knowledge of what flatulence or palpitation may be.

Slight Scoliosis a Common Source of Apparent Enlargement

It is a common experience to find that a school child is suspected of having slight enlargement of the heart because the apex-beat is noticeable and about the nipple line or even a trifle beyond. Almost every doctor is aware how important it is to settle the question, for a cardiac defect in youth has greater significance than in the old. The suspicion this apex-beat arouses has been mentioned by Sir Thomas Lewis.[70] It is generally the only doubtful sign, and if there have been symptoms they have been trifling or incidental. The pulmonary second sound may be accentuated, probably from displacement, but murmurs are absent.

For some years I was worried about such an obtrusive apex-beat until I happened to notice that these children had often a slight scoliosis of the common type, that is with dorsal convexity to the right. It was first noticed on radioscopy, for the heart lies a trifle too far to the left so that perhaps four-fifths of the cardiac shadow instead of two-thirds lies on the left of the midline. Confirmation was obtained by rotating the subject a few degrees to the right when the heart appeared much as one would expect in health, placed normally as regards the middle of the chest, and not at all enlarged (Figs. 3 and 4). In other words, this positional correction removed an illusion of disease. Other features of the uncorrected position are slight accentuation of the aortic knuckle, of the pulmonary arc, as well as of the left ventricle, the three constituents of the left border. When this cause for a displaced apex-beat is suspected, and it should be when the cardiac history is negative and it is the only sign, recourse to radioscopy will show the appearances here described and examination of the back a slight scoliosis. Owing to rotation of the vertebræ the line of the bodies is more deformed than the line of the spinous processes, so that X rays show the condition to be worse than one would expect from inspection of the back.

Now the radiological changes in the heart from considerable scoliosis have often been described, but it seems to me more important to draw attention to these minor grades which, I am convinced, oftenest explain an erroneous diagnosis of slight enlargement in children of school age. Once recognised as an unimportant and trivial displacement, no further attention need be drawn to the heart in these young subjects; and the school medical officer, nowadays so rightly unwilling to stop games without good reason, can accept this assurance.

In the past it has often happened that this deceptive apex-beat has been attributed to real enlargement

indicating a cardiac lesion, and the stigma has followed a healthy subject perhaps for a lifetime.

Fifty years ago, a young Irish doctor joined the Navy just escaping rejection as the apex-beat was a little out of place. Subsequently doctors used to assign him an hypertrophied or a dilated heart. To-day this man is aged 73 and plays golf without symptoms. The apex-beat is still noticeable, but X rays show a spinal curve to the right and a slight displacement of the heart to the left without enlargement. A glance at the patient's back shows moderate scoliosis with dorsal convexity to the right.

Positional changes of the heart in high grades of scoliosis are known, but not, perhaps, sufficiently

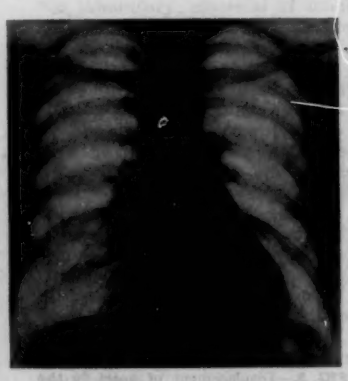

FIG. 4.—Common displacement of heart from slight scoliosis often leading to suspicion of cardiac enlargement.

FIG. 5.—Considerable displacement of heart from scoliosis; apex in left axilla. Superficial resemblance of dorsal curvature to an aneurysm.

FIG. 6.—Displacement of heart to the right—a partial dextrocardia—from scoliosis of the rarer type—i.e., left dorsal convexity.

well known.[98] It was very difficult to credit with a sound heart a woman of 56 showing the X ray picture reproduced in Fig. 5, but her freedom from symptoms and any other sign and a complete investigation in hospital proved that actually she had.

Scoliotic displacement of the heart to the *right* has not the same clinical interest because it is produced by the rarer type of scoliosis, that with dorsal convexity to the left, and because it will scarcely be discovered except by radiology. None the less it is a real source of displacement; and in a recent case it was so pronounced that I took it for an acquired dextrocardia which, in a sense, it was (Fig. 6).

A similar instance, though less pronounced, was a man of 26 who, in 1916, was examined at the Heart Hospital and was rejected for the war because X rays showed the heart displaced to the right as I have been able to confirm from the original notes. This year, twenty years later, I examined him for an illness unrelated to cardiac enlargement, and found that he still showed that cardiac displacement which had for its cause a scoliosis with dorsal convexity to the left.

Adherent Pericardium

Four forms of adherent pericardium may be considered.

(1) *Adhesive pericarditis* (non-constrictive).—Obliteration of the sac, partial or complete, is often symptomless and no more than a chance post-mortem finding. In fewer than half the cases so discovered is there any associated cardiac disease.[104] Among these must nowadays be included coronary thrombosis, for the acute infarct-pericarditis in healing may initiate a chronic adhesive pericarditis; and 6·2 per cent. of Smith and Willius's[104] cases of adherent pericarditis were ascribed to this.[79]

There appears to be no cardiac enlargement from uncomplicated adhesive pericarditis and when found it is referable to the associated cardiac disease. Calcification of some degree is found post mortem in a certain proportion (about 10 per cent.) of cases of adhesive pericarditis and is considered later.

(2) *Constrictive pericarditis.*—Chronic adhesive pericarditis may cause a constriction of the heart, especially affecting the auricles and, most important of all, the superior and inferior venæ cavæ. Constrictive can only be fairly applied to the chronic process, for although there must be a compressive factor in gross pericardial effusion, the other factors—infective and myocardial—sufficiently obtrude to mask it. The result of chronic constriction is no ordinary heart disease, enlargement, or failure, though from such it has to be distinguished, but a special group of symptoms and signs which were clearly presented to us in London last year by Dr. Paul White in his St. Cyres lecture on chronic constrictive pericarditis (Pick's disease) treated by pericardial resection[116] which was so much appreciated in this country. He said that heart disease itself is a rare association, and that rheumatism has so little a place in its ætiology that the presence of mitral stenosis excludes it. It is a state of *congestion without cardiac failure*. A mechanical obstructive problem, one affecting the inflow of blood to the heart, requires surgical treatment (true cardiolysis, not mere thoracolysis); and further successes as those he already describes would go far to confirm the pathology. No doubt there are mixed cases, where the myocardium is also affected; for example, auricular fibrillation was present in 4 of his 15 cases, and 6 of 17 cases collected by Schur[95] from a different standpoint. The need for strict choice of patients likely to benefit from surgery is apparent, though White says that "the commonly expressed fear that constricting adhesions once removed may reform has proved entirely groundless."

Of his 15 cases, the heart shadow on X ray examination was normal in size in 7, slightly enlarged in 5,

and moderately enlarged in 3 only. As stated, none had mitral stenosis, and of three patients with enlargement of the left auricle (X ray) two had auricular fibrillation. It is because too much attention has been directed to alleged pathognomonic but uncertain signs and too little to the total clinical picture, that the condition has so seldom been recognised.[112]

(3) *Calcified pericardium.*—Although formerly looked upon as a distinct rarity, calcification of the pericardium is more frequent and diagnostically more important than was thought. It was found in 10·4 per cent. of Smith and Willius's series [104] of adherent pericardium, and in 10 per cent. of William Evans's series which is to be mentioned later. It is important because it can now so readily be seen in life with X rays, and because its presence affords a proof of adhesive pericarditis as certain as one could wish. It can be missed on radioscopy or on routine films, but with appropriate technique it can be made obvious either in the anterior or oblique positions.

Yet calcification per se, this conclusive evidence of considerable and long-standing adhesive pericarditis, is commonly found to produce no symptoms of cardiac inadequacy and no enlargement, or no more than could be explained by the superimposition of a much thickened pericardium. I was first impressed by these facts in meeting Vilvandré's patient [111] who was a good walker and free from any but her gastric symptoms.

On the other hand, constrictive pericarditis which is producing symptoms is also often accompanied by calcification as would be expected. It was present, for instance, in 6 of White's 15 cases.

In 1920 I admitted to the cardiac department of the London Hospital a man of 25 who complained of epigastric fullness and was found to have slight enlargement of the liver and a palpable spleen. At that time no cause was found for these signs and he went to live in Canada and did not return until 1930, ten years later, when I saw him suffering from dyspnœa and œdema with enlargement of the liver and spleen as before, but more pronounced. Fortunately on screening I saw the dense shadows of a calcified pericardium (Fig. 7). From 1930 to 1932 he had persistent ascites and œdema though salyrgan often gave him relief. He died in 1932 and Dr. Evan Bedford procured a necropsy. The heart was scarcely enlarged and a thick shell of calcification enclosed it. This was probably a case which earlier in its course might have been considered suitable for cardiolysis on the lines discussed by White.[116]

(4) *Mediastino-pericarditis.*—In my time, a candidate for a final medical examination asked for the causes of greatest cardiac enlargement was expected to reply aortic stenosis, aortic incompetence, and adherent pericardium. It was understood that with the last, external adhesions (mediastino-pericarditis) might be necessary. I do not know how it is to-day, but I could not now agree with this answer. It is now certain that adherent pericardium is seldom a cause for enlargement at all, even if so complete and considerable as to be calcified. External adhesions of any moment are so rare that they are unworthy of the attention they have curiously attracted in the past. As Wenckebach [114] showed, they may disturb respiration as much as they hamper the heart. In Smith and Willius's series, among 8912 necropsies were 144 cases of adherent pericardium. Among them 12 showed fairly extensive adhesions to surrounding structures, and of these, only 3 were uncomplicated—i.e., unassociated with valvular or other heart disease.

Dr. William Evans has kindly abstracted for me figures on the incidence of adherent pericardium as a cause of cardiac enlargement from the records of the pathological department of the London Hospital by courtesy of Prof. H. M. Turnbull.

In a series of 10,000 consecutive necropsies in which the heart was examined, fibrous adhesions between the visceral and parietal layers of the pericardium had obliterated the pericardial space in 83 cases. Calcification of the pericardium was present in 8 of these, but it was only a prominent feature in 2, while in the remaining 6 it was present as scattered plaques. Extrapericardial adhesions were only described once, and even in this instance they were not extensive. Although it is unlikely that extrapericardial adhesions were absent in each of the other 82 cases, it is improbable that they formed a noticeable feature in any.

Attention was paid to the weight of the heart and to the condition of the valves and heart chambers. If the weight exceeded 12 oz. in the female or 13 oz. in the male, or if hypertrophy of the heart chambers had been described at necropsy, cardiac enlargement was assumed to be present.

In 34 of the 83 cases the heart showed no abnormality; it was not enlarged and the valves were healthy. Cardiac enlargement of varying extent was present in the remaining 49 cases. In 3 of these, enlargement of the right ventricle had followed chronic lung disease, and in another 3 the left ventricle was enlarged from hypertension. In the remaining 43 cases, rheumatic valvular disease involving the mitral, aortic, and often the tricuspid valves, accounted for the presence of cardiac hypertrophy both in its extent and distribution. In each individual case Dr. Evans formed the opinion that the cardiac hypertrophy was wholly due to the valvular lesion and that the presence of adhesive pericarditis was in no wise a contributory factor.

Whenever considerable or gross enlargement of the heart has been found on clinical examination without causal hypertension or aortic incompetence, we have in the past too readily attributed it to adherent pericardium. We have entertained the diagnosis of adherent pericardium too often, and of grossly enlarged auricles with fibrillation too seldom; though the frequency with which aortic valvular disease is a participant or sufficient cause of cardiac enlargement has not been exaggerated. When a high grade of mitral stenosis is present, and auricular fibrillation supervenes, the collapsing pulse and the diastolic murmur of aortic incompetence frequently disappear. It seems to me likely that some of the cases, now increasingly reported, of aneurysmal dilatation of the left auricle in mitral stenosis may have erroneously been ascribed to concurrent adhesions. Crighton Bramwell [17] noted and tabulated the incidence of pericardial adhesions in reported cases of aneurysmal dilatation of the left auricle, but examined and rejected the evidence that they are an important factor in determining it.

Dilatation of the Heart

Acute dilatation has gradually lost its original significance in a clinical sense, and is now a superfluous term in so far that it is never now maintained that heart failure is due to acute dilatation or synonymous with it. It should be strictly dissociated from any clinical features, whether symptoms or signs, which have been supposed to indicate or coincide with it. It will be an excellent thing if we abandon even in our terminology the idea that clinically the heart can dilate like a balloon in a few minutes or a few hours and thereby induce an abrupt and grave attack akin to heart failure. There is no reason why a sinister meaning should be attached to a change in size; and to reach any agreed and profitable conception, size must be clearly separated

from symptoms. Once "acute dilatation" is out of the way as a clinical term, we may proceed to inquire whether as a simple fact the heart is capable of acute dilatation or acute distension, or, as we might almost now say, rapid enlargement. Admittedly, the heart, even the healthy heart, can and often does dilate. Thus after an extrasystole which fails to eject the usual amount of blood from the ventricle, the heart is overfilled and dilates so much that by radioscopy it can be seen to halt and then to swell. This accounts for the large volume of the returning or subsequent radial beat. Another example of the possibility of dilatation is Müller's experiment where at the end of normal expiration the breath is held and an extreme effort is made to inspire against obstruction. This increases the negative intrapleural pressure with a resultant temporary "acute dilatation" though a harmless one, and it can be confirmed by teleradiogram.[26] Apart from such almost physiological but rapid changes in the heart volume, the question has been definitely raised,[48] is there such a thing as an acute temporary dilatation of the normal heart? Without attempting a full answer, we may consider certain cognate subjects bearing upon it.

(1) "Acute dilatation" from a particular act of *exertion* appeals more to the lay than to the medical mind. Medical opinion is now firmly opposed to the idea that the healthy heart in a healthy man can be injured by physical strain. Many have been keenly watching, as Mackenzie did but without success, for a patient with a disability acquired solely in this way. Usually, the alleged cause is trivial or impossible; often symptoms began some hours (even a day or so) after the exertion which is blamed; though, as Mackenzie used to say, the heart does not remember. There is remarkable agreement that the heart is often a trifle smaller (or at least narrower) after exercise than before. To take an example, McCrea, Eyster, and Meek,[77] spared no pains in the care with which they recorded the effect of exercise on diastolic heart size, and concluded that such variation as the heart undergoes during exertion is slight, that its size may remain unchanged or increase or decrease slightly. It is evident that there may be temporary adjustments; but the immediate effect of exercise on the heart's volume is insignificant, and this applies even where the test exercise has been extreme and prolonged.

Leaving the question of the immediate effect, it might be that the effect of prolonged and recurrent exertion would be to produce enlargement of the heart. Here we have at our disposal in the literature regular series of direct observations made upon athletes which have appeared in various countries, in this country by Crighton Bramwell and Ellis.[18] The heart of an athlete may be somewhat larger than the average in relation to body-weight in particular forms of sport of which swimming, wrestling, and cycling may be mentioned. Such enlargement is not to be regarded as abnormal, rather may it be counted supernormal, as, for instance, in successful Marathon runners.

The ultimate effects of persistent devotion to athletics is a matter of perhaps even greater interest. The crews of the first twenty-four Oxford and Cambridge boat races up to 1869 were followed up by Morgan, and he found that there was little appreciable difference in the mortality from heart disease among them when compared with men of a corresponding age.[52] So far as I know, no one has published any satisfying series of soldiers proved to have permanent cardiac injury as a result of physical strain in war. The "soldier's heart" was not enlarged, though the accompanying tachycardia often gave the illusive impression of enlargement at the apex-beat.

(2) *Paroxysmal tachycardia* has often been cited as a good example of acute dilatation, or, as we had better say, rapid enlargement of the heart. It is nature's own experiment not only on cardiac enlargement, but on pure myocardial failure; and it was partly from his observations on the failure resulting from prolonged tachycardia that Mackenzie disliked the idea of back pressure as it used to be taught. In most subjects the heart is sound, but liable to sudden bouts of extreme tachycardia. Although it has been said that enlargement quickly occurs—e.g., some hours after an attack begins—I have been unable to confirm this in a few such cases examined by X ray. Yet there is no doubt that with persistence of a paroxysm there may be enlargement of the heart with evidence of cardiac failure in all its stages. The earlier observations of Dietlen[29] and others[67] have been fully confirmed. Some time ago I had the opportunity of watching the development of enlargement in a patient whose attack lasted under observation for 21 days. By that time there was some enlargement, though not extreme, but the cardiac silhouette was obscured by pulmonary congestion and small bilateral hydrothorax.

Similar conclusions apply also to paroxysms of, or the onset of, auricular fibrillation and flutter. I have not recorded any rapid enlargement within a few hours or even days of the onset in cases I have observed. As the condition begins to derange the circulation, then we begin to see the effect on size also. It is rather the length of time taken to produce demonstrable enlargement than the rapidity with which it occurs that has impressed me (Fig. 8); see also.[39] It can easily be shown that the enlargement of the left auricle in mitral stenosis is not a sudden occurrence, for it can be followed in its gradual enlargement over years (Fig. 9).

(3) The rapidity of the enlargement which may take place in the course of acute *cardiac rheumatism* is of perennial interest and importance, though its degree and frequency are far from being known. Confusion with a pericardial exudate aside, the part played by a previous attack and early mitral stenosis is always difficult to exclude or appraise when judging enlargement from myocarditis alone. Thus cases become important which are proved post mortem to have no endocarditis although they have died from severe carditis.

Such have been collected and discussed by Garber,[41] who found in the literature 17 cases in which the diagnosis of rheumatic carditis was found at autopsy and in which apparently all the heart valves were free from endocarditis. He adds an additional case, and another has recently been reported in an interesting paper by Bland, Paul White, and Duckett Jones.[14] Incidentally, these workers also discuss the occurrence of a mid-diastolic murmur at the apex in rheumatic cases where mitral stenosis was absent and where the cause of it could only be ventricular dilatation. The mitral valve in Bach and Keith's important case [4] was not stenosed, yet the left auricle was very large.

No one can doubt the rarity of this rheumatic carditis without endocarditis, so the original problem remains: how to exclude the effects of previous valvulitis or active valvular disease in deciding the presence of rapid enlargement during an attack of rheumatism. As indicated, percussion and the position of the apex-beat under these circumstances afford uncertain evidence. What is required is radiographic evidence that the average patient in a first

attack of rheumatism with the heart affected does, in fact, show early enlargement from acute myocarditis. That evidence appears to be still wanting, and until it is forthcoming we must be content with the clinical data which are adequate for the purpose of a relevant diagnosis.

Many other infections besides rheumatism have been said to cause acute cardiac dilatation, but generally the statement has been founded on a combination of unreliable physical signs in the presence of a heavy infection. But radiological studies have not yet shown that in these various infections, such as pneumonia and diphtheria, actual dilatation of the heart occurs in any material proportion. In pneumonia we are fortunate in having the results of a recent detailed study by radiological means in the work of Davies, Hodgson, and Whitby,[27] carried out with the support of the Royal College of Physicians. They kept close watch for changes in the heart, but in the whole series of 119 cases found only 3 patients in whom there was any definite change in its size. In these 3 cases, too, there were no clinical symptoms suggestive of cardiac disability, and all had a relative bradycardia. It is unnecessary to view such a bradycardia as an indication of a myocardial defect as it is too common a finding in normal convalescence, both from infections and from parturition, indeed many have looked upon it as a favourable sign. Besides, bradycardia itself is a sufficient cause for a slight increase in heart size as Rösler [93] confirmed.

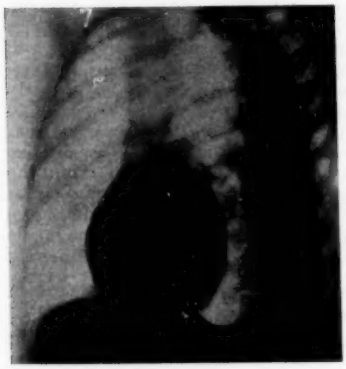

FIG. 7.—Calcification of pericardium. Left (II) oblique position.

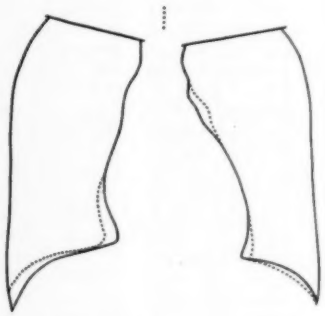

FIG. 8.—Mitral stenosis. Outline of teleradiogram, anterior view. Dotted line: five years later and after auricular fibrillation for one year.

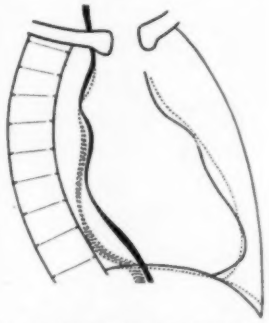

FIG. 9.—Mitral stenosis. Outline of teleradiogram, right (I) oblique position. Barium in œsophagus shows slight enlargement of left auricle (continuous line), and greater enlargement five years later (dotted line). Same patient as Fig. 8.

(4) The remaining condition which has to be considered from this standpoint of rapid enlargement is that which may occur with acute *congestive heart failure*. At once I must admit that even with radiological aid it is no easy matter to decide. The first difficulty is that it is so rare for a heart of normal size to fail at all, though Nemet and Gross [84] found that out of 89 cases of failure there were 3 in which the heart post mortem was found to be free of hypertrophy—i.e., of normal weight, which is of course not the same thing as normal volume. We must assume, therefore, that the heart in failure is enlarged. The other great difficulty is the fact—which is not yet sufficiently realised—that one of the early effects of failure is raising of the diaphragm from hepatic and other abdominal distension inseparable apparently from failure of this kind. We have seen how much the position and apparent size of the heart depend upon the height of the diaphragm, and in failure it is a real bar to a ready judgment on increase or decrease in size. Probably it is the chief factor in producing that outward displacement and recession of the apex-beat which as students we had to watch in the course of failure and recovery. No longer can this apex-positioning be accepted as clinical proof of enlargement. Again, the frequency of hydrothorax in failure is scarcely appreciated until such patients are examined radiologically by routine when they come to hospital in failure; indeed hydrothorax may have a profound effect upon the apparent size of the heart or may swamp the heart almost completely.

Friedman and Strauss [40] studied 21 cases of cardiac failure by X ray methods during recovery and found that there was no change in size in 35 per cent., a decrease in all diameters in 35 per cent., and a decrease in one border only, generally the right, in 30 per cent.

For some years Dr. Bedford and I have collected from time to time orthodiagrams or teleradiograms of patients before and during failure, or during failure and afterwards, to see what happens to the heart size, and we have found nothing to support the old notion that anything in the nature of an acute dilatation occurs with ordinary heart failure. The difficulties have been indicated, but we are satisfied that rapid change in size is always slight if it can be demonstrated at all. With the clinical sign of venous engorgement in the neck, one would expect to find by X ray distension of the superior vena cava and of the right auricle, and this is probably the main alteration which does take place in the outline of the heart in simple failure. This is but a fragmentary statement about the radiology of heart failure where pulmonary congestion often dominates the situation. Such enlargement of the heart as does occur in failure is mostly from congestion, producing the so-called mitralisation of the heart. In failure there is change in shape and position rather than change in size (Figs. 10 and 11).

Hypertrophy

It will be evident that I am not so placed that I can with any profit to you inquire far into the physiological and pathological theories and views about hypertrophy and the mechanism of its production. The opinion which has prevailed and still prevails is that hypertrophy is a response to increased demand—

a work-hypertrophy. Starling showed that dilatation is an essential physiological adjustment to increased work. Hypertrophy may then follow to meet a persistent demand on the heart.

From time to time other causes are advanced, and Sir Thomas Lewis,[69] from his early but unsurpassed examination of the relative weights of the ventricles, formed the opinion that mechanical factors are by no means the only important causes of hypertrophy; and Cotton's work[25] supported it. Toxic substances are said directly to stimulate the heart muscle-fibres to hypertrophy,[105 106 86] and prolonged thyroid feeding to lead to hypertrophy.[118] Lewis and Drury,[71] from their observations on arteriovenous aneurysm and the enlargement of the heart which accompanies it, suggested that diminished coronary flow and undernutrition might be the cause of enlargement, not only in that condition, but also in others such as severe anæmia and narrowed coronaries. Some experimental support for this attitude has been produced.[100] Wiggers [117] feels that there is no evidence that changes in quality or quantity of blood-supply, or the presence of toxic or infectious agents, can themselves induce muscle growth, but probably do so by disturbing function and leading to increased diastolic length. This hæmic or toxic origin of hypertrophy is not merely of academic interest, for it has recently gained prominence among those interested in the question of cardiac hypertrophy in coronary lesions. Willius and Smith [119] examined the hypotheses and favour that of increased work, as do Nemet and Gross.[84]

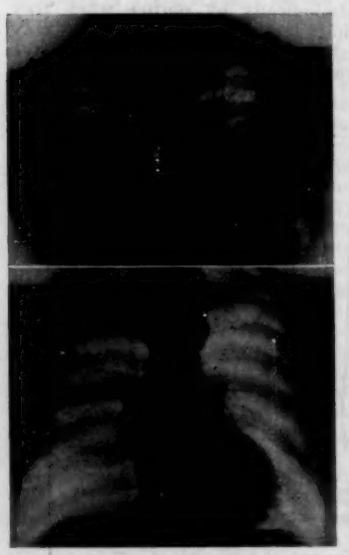

FIG. 10 (above).—Hypertension. Congestive failure. Note raised diaphragm, horizontal heart, congestion of hilar vessels.

FIG. 11.—Same patient. Recovery from congestive failure. Note descent of diaphragm, more vertical heart, absence of hilar congestion.

Assuming that for the most part hypertrophy is a response to increased work, let us see where the change in muscle mass or bulk occurs to meet the demand. Karsner and his co-workers [24] confirm by accurate study the belief that it is due probably to hypertrophy of the individual muscle-fibres without an increase in the number of fibres. All fibres tend to approximate to the larger size, and they suggest that when all or nearly all the fibres have attained the maximum, further hypertrophy or compensatory development is impossible. This raises the pertinent question of what else does or can limit the response by hypertrophy. It has been said that a limited blood-supply may do so (but see Lewis and Drury [71]); Russow [94] says that undoubtedly the supervention of functional disabilities such as auricular fibrillation may so act.

In a clinical sense, hypertrophy is a life-saving and beneficial process; almost one might say that the heart enlarges as it ought to do under adverse circumstances. A good example of physiological hypertrophy is the increase in the relative size of the left ventricle after birth, for the child is born with right and left ventricles of the same wall thickness. The blacksmith's arm and the athlete's heart are admirable examples of purposive adjustments.

When the weight of the heart exceeds about 300 g. in a man and 250 g. in a woman, the limits of normality are approached. Ready figures in use in England as a limit of normal weight would be 11 oz. (or 330 g.) in men and 10 oz. (300 g.) in women. Weighing of the ventricles of the heart separately [69] and exacter measures of the size of the auricles will be needed as a regular pathological routine if radiological findings in life are in future to be properly correlated at death. Of course, weight is easier to estimate than volume if only because of post-mortem changes, but volume mensuration would be invaluable. Paul White [115] has made some trenchant remarks on the limited value of post-mortem tables of heart weights which are so often the end-results of completed disease.

Although under favourable circumstances one might regard hypertrophy as a responsive strengthening of the heart, as e.g., in the overloading of hypertension, yet in practice this is seldom true, and for two reasons: first, associated disease in the coronary arteries with consequent lesions of the myocardium, old or recent or both; second, the persistence or increase of the peripheral obstruction which initiated the enlargement.

THE INFLOW AND OUTFLOW TRACTS IN CARDIAC DILATATION AND HYPERTROPHY

In 1930 Kirch [58] published a full statement of his findings and views upon ventricular hypertrophy, and in 1934 [59] he published some further observations and reference to experimental work in support. His earlier papers on the subject may also be consulted.[60 61]

His researches were conducted by exact weighing of the separate chambers and septa of hypertrophied hearts by Müller's method, and also by linear measurements of the chambers. By these means facts were assembled not only on the weight, but on the volumes of the chambers, the ventricles in particular. Apart from normal controls, the hearts of patients with non-valvular heart disease alone were studied, mostly pulmonary heart disease (for right ventricle) and hypertension (for left ventricle). He found that, taking a single ventricle, the process of dilatation (and hypertrophy) always began in a particular portion of it, and only later was the rest of the ventricle implicated. So he distinguished in each ventricle two separate functional portions, and called them the inflow and the outflow tracts.

Taking the right ventricle, which illustrates his views best and has been most fully worked out, the inflow tract extends from the tricuspid orifice to the apex and comprises the posterior wall of the right ventricle and septum adjoining. The outflow tract extends from the apex to the pulmonary orifice and comprises the anterior wall of the right ventricle and adjoining septum. Every dilatation (and hypertrophy) begins in the outflow tract and is characterised by lengthening of the outflow moiety of the ventricle. This lengthening of the anterior portion of the right ventricle is betrayed by prominence of the conus—i.e., the far end of the outflow tract. There is also some lævorotation of the heart on its long axis.

When the inflow tract is affected, and it is never affected until later when the outflow tract has acquired its characteristic change, it is a widening or broadening of the inflow portion of the ventricle which occurs. In other words, late stages of hypertrophy and dilatation of the right ventricle involve the posterior and apical portions, and the ventricle broadens. It is only with the supervention of chronic congestive failure that the right auricle and eventually the left ventricle will show consequent change.

These principles are applicable also to dilatation and hypertrophy of the left ventricle, where lengthening of the outflow tract with early change in the subaortic region is described, though it is less easily demonstrated than in the right ventricle.

It will be a long time before these detailed studies find their correct place in pathology, though they seem important and likely to stimulate progress. It is doubtful, however, whether Kirch is right in trying to adjust Moritz's "tonogenic" and "myogenic" conceptions to these pathological findings of an outflow and an inflow tract. From a radiological standpoint, they do seem to explain in fair measure the changes we have found—e.g., in emphysema. The bearing of Kirch's research on radiocardiology has already been noticed by certain workers, Kudisch [84] Zdansky,[120] and especially Nemet and Schwedel.[85]

In my next lecture I hope to speak on clinical enlargement chiefly as it affects the separate chambers of the heart.

THE TREATMENT OF ANORECTAL WOUNDS*

By W. B. Gabriel, M.S. Lond., F.R.C.S. Eng.

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In the surgery of the lower rectum and anal canal difficulties have to be contended with which render primary suture of wounds unusually liable to failure. The difficulty in sterilising the anal skin, the risk of subsequent fæcal contamination, the movements of the sphincter, and the poor vascularity of the subcutaneous tissues all tend to spoil the results of aseptic surgery. In practice it is seldom advisable to attempt primary suture of wounds in the anal region unless they fall short of the anal margin and the anal canal. The commonest indications for primary suture occur after excision of the coccyx for cure of coccydynia, and excision of postanal dermoid fistulæ.

A great saving of time is effected by a successful suture of these wounds when compared with the time taken for healing by granulation; dermoid fistulæ are suitable for excision and suture if they are free from active suppuration and if the sinuses are in the middle line. In suturing these wounds a few deep sutures must be placed with the object of obliterating the depth of the wound, and are tied over a roll of gauze after suturing the skin with interrupted mattress sutures. Buried catgut ligatures should be avoided, any hæmorrhage being stopped by forcipressure or twisting. A firm dressing is applied over the anchored dressing and is kept in position by transverse strips of Elastoplast. The bowels are subsequently kept confined for six or seven days and the sutures are removed between the sixth and eighth day in order to prevent them cutting through and producing stitch sinuses. A recent case has been that of a man aged 26 with a dermoid fistula presenting three or four sinuses. It was excised and sutured; the wound healed by primary union, and he was discharged from hospital on the fifteenth post-operative day. Healing by granulation would have taken at least five weeks.

I have found by experience that primary suture is not likely to be successful if secondary openings have formed at a little distance left or right of the middle line; in these cases so much skin must be excised in order to remove the lesion completely that the wound cannot be sutured except under tension, and it invariably breaks down.

Primary suture is also required in the treatment of certain tumours in this region. Anal lipomata are suitable for enucleation and suture of the resulting wounds. I have excised a sacrococcygeal chordoma the size of an orange, and the resulting deep wound was closed by primary suture over an anchored dressing; it healed cleanly.

In operations for anal fistulæ primary suture is now seldom attempted. The only type for which suture could be contemplated is the short direct fistula; this usually arises in the anal canal and after primary suture there is a considerable risk of infection and breaking down at the anal extremity of the wound; if this takes place the patient is left with an ulcer at the anal margin which is unlikely to heal until it is drained externally. In order to save the disappointment and delay of such a setback the method of incision and laying open of fistulæ is now universally adopted.

HEALING OF ANAL WOUNDS

Healing by granulation is the only certain method of obtaining sound healing of wounds extending into the anal canal. In order to procure consistently good results in this region of the body the surgeon must set out deliberately to leave open wounds of such a shape and size that healing by granulation will take place, and he must be prepared to organise and supervise the after-treatment with this end in view. An anal wound cannot be considered to be finished from a surgical point of view until it is healed and has been proved to be capable of withstanding the ordinary stress and strain of active life.

A wound in the anal canal must be drained externally, and if the resulting wound be considered to be partly internal—i.e., that part which is within the grasp of the sphincter muscles—and partly external, it is invariably found that the internal part heals more slowly than the external part. This is particularly true of wounds in the middle line, whether anterior or posterior to the anus, and is due partly to the squeezing up effect of the external sphincter which tends to prevent proper drainage of the anal extremity of the wound, and partly to the increased tendency of the soft parts externally to fall together.

Drainage of an anal wound is made effective by *cutting away skin* and this is really the basis of all rectal operations. The anal skin is very lax; it is liable to become swollen either from œdema or from underlying congestion or thrombosis of the anal veins, and with experience one learns that excision of a certain amount of skin is essential for maintaining drainage, and it is also one of the best ways for sparing the patient post-operative pain.

In order to provide more adequate external drainage than would be given by a linear or oval wound, which would require plugging to keep it open, it is customary to aim at leaving a racket-shaped or

* Address given to the Manchester Surgical Society on Jan. 21st.

triangular wound, the broadest part of the wound being external to the anal margin. This principle of excising skin is applied with advantage in almost every anal operation; its greatest value is seen in the case of abscesses, anal fissures, and fistulæ. Any form of anorectal abscess which points externally is well treated by excision of the entire skin covering it—the so-called scalping operation. Care is taken not to cut the external sphincter and complete drainage is given so that as a rule all the anal abscesses, and at least half the ischiorectal abscesses, heal without a second-stage operation.

In the case of anal fissures and fistulæ the area of the external wound must vary according to the particular case, but as a working rule it may be said that the deeper the fissure and the more difficult the fistula on account of deep tracks or submucous pockets, the more adequate must be the external drainage. The cutting back of a fistula wound into healthy tissues is commonly known as "Salmon's back-cut" and is still the basis of most fistula operations. It may be of interest to repeat the words of a visitor to St. Mark's Hospital in 1857, two years before Salmon, the founder of the hospital, retired: "One of the features which must strike a looker-on at St. Mark's is the very great freedom with which the knife is employed. In the operations for fistula and for fissure Mr. Salmon makes very free and deep incisions; and, indeed, his rule in the former of cutting the base of the sinus as well as the sphincter, necessarily involves an extent of incision at least three times that usually employed." This tendency to make large external wounds has been handed down from one generation of surgeons at St. Mark's Hospital to another, and this is good presumptive evidence that the method is a sound and practical one for these difficult cases.

USE OF TANNIC ACID

Granted that an anal wound is made of the requisite size and shape, it must be maintained so after operation; if by some mischance the wound margins fall together so that the external surfaces adhere, the area of external drainage may be greatly reduced in size within a few days. As has already been mentioned, this is particularly liable to happen with midline wounds. Premature external healing of the wound is likely to result in incomplete healing; there are two ways in which this tendency can be minimised.

1. *Cauterising or coagulating the wound surfaces.*—This can be done with the actual cautery or diathermy electrode or by application of strong nitric acid. A better method, and one of which I believe this is the first report, is by the application to the wound, at the conclusion of the operation, of a strong solution of tannic acid. A 20 per cent. solution of tannic acid in 1 in 1000 flavine was introduced by Wilson,[1] of Edinburgh, for the treatment of burns, and an even stronger solution of tannic acid, 40 per cent. in flavine, has been used in the Royal Northern Hospital for the same purpose. A single application to a burn produces a firm coagulum, and it has proved most satisfactory in the treatment of burns generally. It occurred to me that this might prove to be very useful for rectal work. When a fissure or fistula wound has been made at operation, hæmostasis is effected by forcipressure, and then the tannic acid solution (40 per cent. in flavine) is applied for perhaps two minutes on gauze swabs; a brownish-yellow surface coagulation is soon produced. The operation is completed in the usual way by injection of sterile vaseline into the lower rectum and insertion of a tube and a gauze dressing moistened in Dettol lotion (½ oz. to 1 pint). I have done this for more than 50 fissure and fistula cases and am convinced of its value; not only do the wounds keep flat but the patients tend to have less pain than formerly, and the dressings come off quite easily on the third day leaving a flat wound of the same shape and size as when the operation was completed.

2. The other way in which the risk of premature and therefore incomplete healing may be minimised is by *insertion of a firm flat dressing* at the time of operation, and keeping it in position until the third day. In this way the skin margins are kept back; when the dressing is changed down to the surface of the wound on the third day and subsequently, it is usually easy to keep the outer part of the wound flat. If, unfortunately, the original dressing is inserted insecurely or comes out prematurely when the tube is removed, it is often difficult to reintroduce a dressing so advantageously as at the operation.

Some writers have decried the insertion of gauze dressings into the anus, but in the treatment of fissures, fistulæ, hæmorrhoids, or any condition where a wound is left at the anal margin, I consider that a moist gauze dressing properly tucked in, with a firm pad of gauze and wool retained by a T-bandage, is essential for correct healing.

MANAGEMENT OF THE EXTERNAL SPHINCTER

It is often advisable to stretch the external sphincter at the beginning of, or in the course of, a rectal operation; pre-operative spasm of the sphincter is one important indication, and another indication is often afforded, after administration of a low spinal anæsthetic, by noting that the sphincter has failed to relax properly; this is usually due to a fibrous infiltration of the contracted sphincter. A sphincter of this type may be restored to normal by a careful stretching, but often, as in the course of operations for chronic fissure, the subcutaneous portion of the external sphincter needs incision.

The stretching of a sphincter has been alleged by some authorities to cause severe post-operative pain. This has not been my experience. I think possibly the results vary according to the anæsthesia employed. If a light general anæsthetic is used it is difficult to stretch a sphincter; it has to be done quickly, forcibly, and probably incompletely, whereas if a low spinal is given three to five minutes can well be taken up in a careful and graduated stretching until four fingers are readily introduced. The stretching effect should be chiefly posteriorly and tight fibres should be ruptured here rather than anteriorly.

If a tight sphincter is well stretched the patient is likely to be free from post-operative spasm and involuntary contractions of the muscle, which are not only painful in themselves but render the subsequent dressings difficult and painful. A relaxed sphincter means comfort, and as an alternative to stretching, in certain nervous subjects with pre-operative sphincter spasm, one of the oil-soluble anæsthetics may be employed (such as A.B.A., B.A.B.A.N., Proctocaine or Percaine in oil[2]) in addition to the main anæsthetic (general or low spinal) which may have been selected. When the patient has been placed in the lithotomy position ready for the

[1] Wilson, W. C.: Edin. Med. Jour., 1935, xlii., 177.

[2] These are solutions of local anæsthetics in sterilised almond oil; the use of oil as a solvent serves to delay absorption and to prolong the anæsthetic effect. The first three solutions mentioned contain anæsthesin or butesin in addition to which B.A.B.A.N. (Martindale) contains 1 per cent. of basic novocain, and proctocaine (Allen and Hanburys Ltd.) contains 1·5 per cent. of procaine base. The percaine in oil is a 0·5 per cent. solution and contains also 1 per cent. of phenol.

operation, as a first step 5–10 c.cm. of the oil-soluble anæsthetic is injected into the sphincter under aseptic conditions through a median puncture about one inch posterior to the anus.

It is often necessary to divide the subcutaneous portion of the external sphincter. In every case of anal fissure which has reached the chronicity which calls for operation, this portion of the sphincter must be divided and stretched. This can be done in any anal quadrant with impunity, and according to the incidence of anal fissures is most commonly required posteriorly, less often anteriorly or laterally.

A deeper incision of the external sphincter ani is rendered necessary in certain cases of anorectal abscesses and fistulæ which arise in the anal canal, and for these the important principle of the two-stage operation with use of the silk ligature is recommended. Infection may begin in a crypt, abrasion, or an intramuscular gland, and usually extends out between the superficial and deep portions of the external sphincter. The most acute abscess of this type is the deep postrectal in which the infection extends back from the posterior part of the anal canal and then begins to spread laterally beneath the anococcygeal raphe into each ischiorectal fossa. When an acute abscess of this sort is drained it is manifest that, on account of its depth, a considerable portion of the external sphincter will need division. On no account should the muscle be divided in the acute stage. If a probe-pointed director is passed through an internal opening high up posteriorly, a stout silk ligature (No. 8 or 12) is passed through the opening on a silver probe or aneurysm needle and is knotted loosely round the contained muscle. The ligature serves to mark the opening and to fix the sphincter muscle by causing it to adhere to the lateral margins of the wound. Two weeks later, under local anæsthesia, the sphincter is incised with scissors and the ligature cut out; sometimes on account of the height of the internal opening it is advisable to cut through the contained muscle in two successive stages. Complete drainage is thus effected and control is not impaired, for the sphincter becomes adherent to the margins of the wound before it is cut across, and later on, as healing progresses, the muscle-fibres become approximated as the scar contracts.

This principle of the two-stage operation is of the utmost importance and deserves wide recognition. It is suitable also for certain cases of anorectal fistulæ with an internal opening between the superficial and deep portions of the external sphincter. If the case is of the anterior horseshoe or semi-horseshoe type with a central track passing deep to a considerable portion of the external sphincter, a two-stage operation is usually imperative in view of the risk of causing incontinence by immediate division of the muscle; with a posterior track the risk is not so great, but even so no harm can ever be done by carrying out the operation in two stages. The time required for healing depends on the area of the wound made for drainage, and is not altered by whether the sphincter is divided at the first or a later operation. Caution is required, therefore, and if there is any doubt the operator can always be sure that the decision to carry out the operation in two stages is not likely to be wrong.

POST-OPERATIVE MANAGEMENT OF ANORECTAL WOUNDS

A satisfactory routine for the average rectal case is to have the bowels moved by an olive oil and gruel enema on the third morning after operation. The importance of leaving the original gauze dressing until then has been mentioned; the gauze is removed by gentle traction on the third morning, assisted by irrigation with a dilute peroxide lotion from a douche can. This is done most easily when the patient is placed on his left side on the edge of his bed, with a mackintosh sheet underneath him leading into a bucket. In very nervous subjects Evipan anæsthesia may be used for this first dressing.

The average rectal patient is allowed to have a hot bath twice a day from the third day onwards, which together with the twice daily irrigation and dressing forms an important part of the after-treatment. The hot bath encourages drainage, and the warmth may help the granulation of wounds, and probably relieves sphincter spasm. In theory it might seem ideal to carry out less frequent dressings as in the Orr method, but in the case of the rectum the two important requirements for the wounds, immobilisation and asepsis, cannot be achieved. It would be difficult to keep the dressings reasonably clean, and there is no guarantee that a gauze dressing, put in after operation, will remain in perfect position from one day to another. The twice daily dressing with mechanical cleansing of the wound by a stream of warm lotion is comforting for the patient, provided that the dressing is done gently and capably. The organisation of rectal dressings on these lines is easy in a special hospital, but it can be done equally well with scattered rectal cases in a general hospital or a nursing-home. The nurses in charge of such cases soon learn to take the requisite trouble, which is rewarded by seeing the smooth progress of healing and by the patient's appreciation of diminishing pain with each dressing.

Two details are worthy of mention:

(1) The majority of cases with anal wounds which are healing by granulation, even if the sphincter has been well relaxed at the time of operation, will tend to develop a spasm or contraction of the sphincter unless steps are taken to counteract this. The passage of a finger every day would no doubt prevent this tendency, but it is difficult for a busy surgeon to do this with regularity, and a better and more uniform dilatation is achieved by the use of the St. Mark's Hospital dilator: the outer end of this dilator has a diameter of one inch. In cases of anal fissure this dilator is passed on the fourth post-operative day, lubricated with a zinc and castor oil cream, and it is passed subsequently by the surgeon, resident, sister, or nurse each morning and evening in the course of the dressings. In many cases of anal fistula the dilator is passed with advantage on the fifth or sixth day, and the same remark applies in the treatment after hæmorrhoidectomy.

I regard the regular use of this dilator as being a most valuable item in the after-treatment; its passage from an early date certainly saves the patient a great deal of pain and ensures smooth healing of the anal extremity of the wound.

(2) The method of inserting the actual gauze dressing is important. With the buttocks well retracted, a corner of folded gauze moistened or lubricated with whatever lotion or ointment may be selected, is tucked with sinus forceps into the anal canal, the external part of the gauze being arranged over the surface of the wound. This should be referred to as a flat dressing, and is not to be considered a plugging, which word gives a totally incorrect idea of the dressing.

There are many other points in connexion with anorectal wounds which I have not touched upon;

for instance, the importance of obtaining tissue for section in all cases of doubtful ætiology and also in inflammatory conditions in order to detect cases of tuberculous infection; the use of ultra-violet light to stimulate healing of wounds, and the occasional use of skin-grafting in certain abscess or fistula cases where an unusually large external wound has had to be made for drainage.

As a general rule, however, one of the objects in view is to delay the healing of wounds external to the anus in order to ensure proper healing of their inner extremities; it is this fact which renders the surgery of this part of the body rather tiresome, and it is well described by the old saying "slow but sure." The lessons of rectal surgery are, I think, worthy of attention, and a man who learns how to open a large ischiorectal abscess and bring the case to a successful conclusion is probably well equipped to deal efficiently with an acute abscess in any other part or tissue of the body. It is instructive to observe that a wound can heal by granulation and yet leave a linear scar, which after the lapse of some months becomes almost indistinguishable from one that has healed by primary union.

THE INITIAL STATE PRINCIPLE
AND ITS IMPORTANCE IN PHYSIOLOGY AND PATHOLOGY

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UNTIL recently the reaction of an organism to a given stimulus was considered to depend on the intensity of the stimulus and its specific nature. It is, however, obvious that the state of the reacting object and of its environment must also play their parts in determining the quantity and quality of the reaction. These indeed are sometimes even more important than that played by the stimulus itself.

Rössle has demonstrated a condition which he has called "pathergy" in which the application of a stimulus leaves the organism in a state in which it is unduly susceptible to subsequent stimuli of a different kind: for example, in some cases of Graves's (Basedow's) disease, tachycardia persists even after the secretion of the thyroid gland has become normal; and a rabbit which is given intravenously a non-lethal dose of cholera vibrio will die if, on the next day, it is given an injection of ordinarily harmless saprophytes. This led Moro and Keller to the conception of a state of "parallergy" in which an allergic state, produced by specific sensitisation, predisposes the body to react to non-specific stimuli. This form of pathergy is seen in the child who develops a positive tuberculin reaction after small-pox vaccination, and Rössle suggests that encephalitis, arteritis, nephritis, and other complications of contagious diseases may be explained in the same way.

Obviously the pathergic state is a much more important factor in the response to a stimulus than is the stimulus itself. True the pathergy was originally due to a stimulus, but once established it alters the reaction to subsequent stimuli, which, in their turn, condition its future development.

How are we to judge, in any particular case, which is of chief importance—stimulus or receptor? Experimentally we may find that a given stimulus always produces the same reaction and that the latter changes when the stimulus is varied. In these circumstances it is the stimulus that is "dominant." Alternatively we may find differing responses to equal stimuli, and here the chief part must be played by the reacting object. When the character of the stimulus is the most important factor in the interaction of stimulus and object the character of the reaction is determined by its intensity or "dose." But when the reacting substratum of the object is more important, search must be made for another indicator which will be a function of the object. A helpful suggestion as to where we are to look for such an indicator is provided by Wilder's "law of initial value" (Ausgangswertgesetz).

THE LAW OF INITIAL VALUE

Wilder showed that the responses of the pulse and blood pressure of a given person to a given dose of adrenaline and atropine vary inversely with the pulse-rate and blood pressure at the time of the injection. The quicker the pulse and the higher the blood pressure to start with, the less they are affected by the introduction of a fixed dose of the drugs. When the initial value of the blood pressure is high enough, the response may even be negative instead of positive—i.e., adrenaline produces a vagotonic rather than sympathicotonic response. From this Wilder deduced a regular interdependence between the initial value of the blood pressure (or pulse-rate) and the character of their reaction to stimuli. Developing this idea, he points out that since the initial value may depend on the state of both divisions of the vegetative nervous system, the effect will depend on how far one of these is already excited. If there is already great hypertony the influence of a stimulant drug is reduced and may become paradoxical and sedative. Thus in bradycardia due to vagus overaction we may find a weak, or even negative, response to pilocarpine and an increased response to adrenaline and atropine. As Wilder puts it, the more intense the function of a vegetative organ, the weaker is its capacity for being excited by stimuli and the stronger its reaction to depressing factors. Smirnoff's concept of the "functional tendency," a factor which determines the reactivity of the vegetative nervous system to endogenous and exogenous stimuli, is in perfect harmony with Wilder's principle. Strong reflexes, he finds, indicate depressed tone in the centres under investigation.

This law of initial value has been demonstrated in operation in many different circumstances, by Wilder and also in our own investigations. For example it has been shown that the effect of adrenaline is greater after removal of the suprarenals—probably because of the low initial value of the blood pressure. On the other hand, old people with high blood pressure react poorly to the same drug. Both adrenaline and ergotoxine cause tonic contraction of the isolated uterus; but if they are applied one after the other (the perfusion fluid being renewed so that the two do not act together) the second either will not exert its specific influence or will produce the paradoxical effect of Langecker. A second injection of pituitary extract given a certain time after the first unit produces a less effect, because the initial value is raised by the first injection. The diuretic effect of pituitrin also varies: in diabetes insipidus it reduces the flow of urine whereas in reflex anuria it increases it. Similarly, parathormone raises the blood calcium in tetany, when the initial value is low, and depresses a level artificially raised by the intravenous injection of calcium. Thyroxine raises the basal metabolism in myxœdema but not in Graves's disease, where

it may even lower it; and it is worth noting that iodine used in Graves's disease will usually prove helpful for eight days or so, until the metabolic rate has reached a certain level, after which it begins to act in an opposite sense.

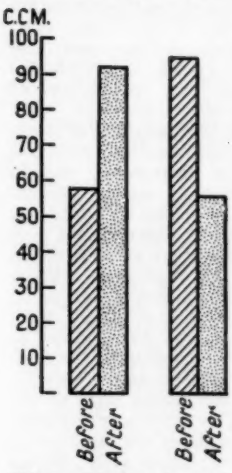

FIG. 1.—Effect of doses of linseed oil on the bile secretion of dogs. The response (shown by the stippled areas) is greater if secretion during the previous 12 hours (shaded areas) has been small.

Again, antipyretics, though they lower temperature in fever, have no such effect on a normal temperature, and may slightly raise it.

Simnitzki's observations on the types of gastric secretion show that, in his asthenic type, when a first stimulus increases secretion substantially a second is apt to lower acidity. In our studies (Leites and Jussin) of bile secretion in dogs we convinced ourselves that the amount of bile secreted depends not so much on the alimentary stimulus as on the state of hepatic function at the time when this stimulus was applied. In Fig. 1 the stippled rectangles represent the secretion during 12 hours after a dose of linseed oil, and it will be seen that this is greatest if the flow during the previous 12 hours has been comparatively small. The same effect is obtained using other stimuli—e.g., peptone (Fig. 2). Failure to allow for variations in the initial state of the bile secretion is probably one of the causes of the contradiction in published data concerning the effect of alimentary stimuli upon this function. Changes in the chemical composition of the bile—e.g., cholesterin content—after taking food may also depend on its initial composition. Thus we have shown that peptone decreases the concentration of cholesterin where this has previously been normal, and does not alter it where it was previously low (Fig. 3).

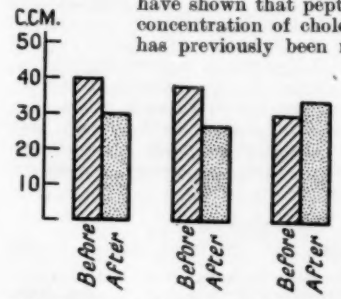

FIG. 2.—Effect of peptone on bile secretion of dogs, showing maximal response when previous secretion has been lowest.

Many examples could also be drawn from processes of metabolism; for experiment has shown that Wilder's law throws light on the metabolic paradoxes encountered in a large number of diseases. Thus ingestion of oil in cases of hepatic disorder causes hypocholesterinæmia whereas in normal persons, or during convalescence, it leads to an *excess* of cholesterin in the blood (Leites and Golbitz-Katschan). When studying the pathology of fat metabolism in diabetes we (Leites, Sorkin, and Agaletzkaja) established in some cases that the behaviour of the neutral fat, and of the ketone bodies, was related to their initial value (Table I.). It will be seen that, in the case illustrated, when the initial value of the fat and ketones was normal a dose of fat (75 g. of butter) increased the neutral fat and decreased the ketones; but with the same patient on an Adlersberg-Porges diet (containing the minimum of fats) the same dose lowered the fat content and raised the ketones of the blood, since the initial value of the fat was high and that of the ketones was low.

The observations I have cited make it clear, I hope, that the law of initial value has general applica-

TABLE I

Effect of a dose of 75 g. of butter on the neutral fat and ketone bodies of a patient on an ordinary diet (A) *and of the same patient on a diet poor in fats* (B).

Patient.	Neutral fat mg. per 100 c.cm.			Ketone bodies mg. per 100 c.cm.		
	Before.	3 hrs. after.	6 hrs. after.	Before.	3 hrs. after.	6 hrs. after.
A	51	106	112	60	63	32·5
B	171	163	104	6	12	12

tions to physiology and pathology, and that it does something to explain the reaction of an object to a given stimulus, to which I referred at the beginning of this paper. Nevertheless it cannot be applied without reservations. The bare numeral of the initial value does not always adequately represent its quantitative character, and before we proceed to argue from the "initial value" we must ascertain how far it really corresponds, in the given case, to the initial state; for in one and the same initial states there can be different initial values and vice versa. That is why I consider it preferable to speak not of the "law of initial value" but of the "principle of the initial state," endeavouring to discover in every case the relation of this state to the indicator of the initial value.

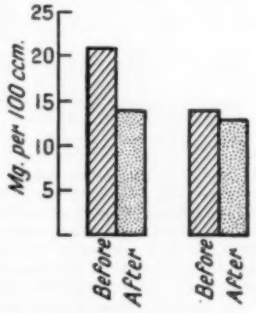

FIG. 3.—Effect of peptone on the cholesterin content of bile, showing a decrease when this was previously high. There is little change when it was previously low.

THE INITIAL STATE

Such an indicator can be of assistance only if we are sure that the stimulus is acting purely on the object whose state it indicates. Now in diabetes as well as in myxœdema we may observe a high level of neutral fat in the blood. In diabetes, following the law of initial value, this level is reduced by ingestion of fat; yet in myxœdema it is increased (Leites, Sorkin, and Agaletzkaja). The reason of this is that in diabetes the high fat content of the blood is due to fat being transported from its depôts to the liver (because of diminution of hepatic glycogen) whereas in myxœdema it is due to disturbances in fat breakdown. In diabetes ingestion of fat fills the liver, reduces its transport from the depôts, and so lowers the fat content of the blood stream; but in myxœdema there is no reason why it should do so since it in no way affects the processes of fat combustion. Thus in diabetes we have an example of a stimulus acting on the object whose state is indicated

by the initial value; whereas in myxœdema we have not.

There is also another particular in which Wilder's law of initial value requires modification. According to him the paradoxical reaction is to be expected only if the functional activity of the reacting organ is high. Our experience, and published records, show, however, that such a reaction may be obtained also when its activity is much depressed. The excitability of a vegetative organ may be greatly lessened, and even inverted, by exhaustion of its energies by previous activity or by disease.

Analysis of the conditions under which the principle of the initial state does and does not apply makes it possible to recognise the conditions underlying the responses. The exceptions to the rule may be due first to variation in the reactions and secondly to compensatory processes. The presence or absence of compensatory processes determines, in fact, whether the principle of the initial state shall or shall not manifest itself. This statement is amply borne out by work on the physiopathology of the fat and lipoid metabolism in various endocrine disorders.

A typical example is shown in the case of a patient who was admitted suffering from uncompensated diabetes. The blood-sugar was 208 mg. per 100 c.cm., and there were large quantities of sugar and acetone in the urine. A meal containing 75 g. of butter gave the results shown in Table II.

TABLE II

Effect of a meal of 75 g. of butter on the metabolism of a diabetic before and after compensation

—	Neutral fat mg. per 100 c.cm.				Ketone bodies mg. per 100 c.cm.				Sugar in urine.	Acetone in urine.
	Before meal.	3 hrs. after.	6 hrs. after.	9 hrs. after.	Before meal.	3 hrs. after.	6 hrs. after.	9 hrs. after.		
March 10th.	130	102	114	208	65	83	82	80	3·4%	++
April 14th.	243	147	133	120	21	18	24	20	0	0

Although the initial values of the neutral fat and ketone bodies were relatively high they rose nine hours after the meal. Whereas it may be that in other cases, in which the diabetes was compensated, a decline in the ketone bodies was produced by the fatty meal. This patient was suitably treated by diet and insulin, and his diabetes was eventually compensated—i.e., the fasting blood-sugar level became lower and the acetone and sugar disappeared from the urine. His reaction to a butter meal was now, although the initial level of the neutral fat was still considerable, higher than it had been before: 243 mg. After the meal it sank rapidly and by the ninth hour it had reached 120 mg.; the ketone bodies did not rise. This was a paradoxical reaction.

The effect of a glucose meal provides another example of the working of the law. When the blood-sugar is artificially raised by the administration of glucose, and a glucose meal is then given, the blood-sugar will not be increased further, because the islets of Langerhans have been stimulated by the earlier administration of glucose (effect of Staub-Traugott). In diabetes, however, although the initial value of the blood-sugar is high, the islets do not compensate, and therefore a glucose meal will raise the blood-sugar.

CONCLUSION

It is possible, therefore, to formulate the principle of the initial state as follows. If the reactive capacity of the vegetative system is altered in such a way that it reacts weakly to a stimulant and strongly to a depressant, the state of the system must be the paramount factor in determining the reaction to stimulus. It is possible to deduce from this alteration the character of the initial state of the system—i.e., whether its excitability is high or low—and also to form an estimate of the extent to which the system is compensated and the possibility of accommodation.

The practical importance of the principle is therefore considerable. It allows a definite interpretation to be given to many series of phenomena, and in particular to the phasic action of certain stimuli. The alternation of phase in the action of hormones, drugs, nutritive stimuli, and many other agents may be due to the fact that the first stage of their action changes the initial state of the vegetative system, so that the second stage of the action produces an opposite reaction. But the second phase itself brings about another change in the initial state, so that the next reaction is more analogous to the first. For instance, a glucose meal will produce hyperglycæmia but will also change the initial state of the islets, so that hypoglycæmia is gradually induced. This condition, however, stimulates the suprarenal glands and, by changing their initial state, brings about a fresh hyperglycæmic state. The similar alternation of states of hyper- and hypo-lipæmia and ketonæmia after a fatty meal is probably due to the alteration in the initial states of the liver, the pituitary gland, and the thyroid which each of the phases provokes.

Recognition of the principle must modify many current views of pathology. A patient with bradycardia may sometimes be "vagotonic" in the sense indicated by Eppinger and Hess—that is, he must have a weak or even a paradoxical action to adrenaline. According to the initial state principle, however, it is quite possible that a patient with bradycardia who reacts strongly to adrenaline may none the less be "vagotonic" too. In fact, the strong reaction to adrenaline actually indicates a high degree of vagal excitation. Kylin, observing that in essential hypertonia the adrenaline action is weakened and "vagotonic," regards this disease as a "vagotonic" syndrome. But if the principle of the initial state is applied, the essential hypertonia may be regarded as indicating a high degree of sympathetic excitation, which, of course, reduces sensitiveness to adrenaline.

The principle of the initial state should give valuable assistance in various fields of medicine, and in suitable cases assist the correct assessment of the processes at work.

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WEST LONDON HOSPITAL.—Presiding over the annual meeting of this institution on May 21st, Prince Arthur of Connaught said that the Silver Jubilee extensions were now practically complete. The extensions include new casualty, X ray, and pathological departments. All but £4000 of the necessary money has been received.

THE PROBLEM OF REPAIR AND REGENERATION OF THE SEMILUNAR CARTILAGES

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SOME years ago I carried out an experimental investigation into the repair of fractures of the semilunar cartilages of the knee-joint. By injection methods it was found that the peripheral portions of the menisci were well supplied with blood-vessels partly derived from the delicate layer of synovial membrane which extends for a short distance over the extreme peripheral part of the cartilage. No vessels could, however, be traced in the inner or concave portions of the semilunar cartilages, and it appears on clinical and experimental grounds that the central portions of the semilunar cartilages are poorly nourished. Experiments on animals showed that incisions in the more central parts of the semilunar cartilages remained unhealed indefinitely but that incisions in the peripheral area were repaired by fibrous tissue after a considerable lapse of time. This experimental work has since been confirmed by various workers.

REPAIR

The nutrition of the semilunar cartilages is of considerable clinical significance. It is probable that many minor injuries of the semilunar cartilages, particularly small longitudinal tears involving the convex edge, may heal by fibrous tissue, and sometimes evidence of such healing can be seen in cartilages that subsequently have to be removed owing to some further injury. Such cases may remain free from symptoms after manipulation (if locking exists) and appropriate after-treatment. Experience teaches, however, that most lesions of the semilunar cartilages are much more serious, and that in the great majority manipulative replacement combined with special after-treatment is merely of temporary benefit. The long period of complete rest formerly advocated after manipulative replacement of the torn and misplaced cartilage appears for physiological reasons to be useless in materially bringing about repair of the fractured cartilage, and the enforced rest may have troublesome sequelæ in the form of adhesions and muscular wasting. Taking into regard these facts and also the satisfactory results of operation in experienced hands, the question arises: Is it worth while to adopt conservative measures when the lesion is clearly of a severe nature? The answer appears to be that no hard-and-fast rule is possible, and that each case has to be considered from many different aspects before a decision is made.

In persons whose livelihood is at stake, as in many professional footballers, I believe that early removal of the torn cartilage is the wisest policy. Occasionally the player carries on quite well for a variable period after conservative treatment, but recurrence is, in my experience, almost certain; moreover, the playing of such a strenuous game while a torn cartilage is still present in the knee is apt to lead to osteo-arthritic changes.

REGENERATION

So far the healing of injuries of the semilunar cartilages and the clinical implications have been briefly considered. The equally interesting and important problem of regeneration of the semilunar cartilage after removal will now be discussed. One is often asked by patients if anything takes the place of the semilunar cartilage after removal, and why the knee is not permanently weakened by the operation. This is a problem of absorbing interest and concerning which our knowledge is at present immature. It must have fallen to the lot of many orthopædic surgeons to reoperate upon knees for recurrence of symptoms after a previous operation "elsewhere." This experience has befallen me several times. It is often very difficult to ascertain the state of affairs at the original operation, but at the second operation I have often found a structure resembling the semilunar cartilage and presenting various types of lesion, and I have hitherto assumed that in such cases incomplete removal had previously been practised. Some surgeons, for example, remove only the detached central portion of a bucket-handle lesion leaving the peripheral portion in situ. At a second operation by another surgeon for some other condition such as loose body, this peripheral portion might easily, in the absence of adequate details concerning the first operation, be considered a case of regeneration of a semilunar cartilage.

In the second edition of my monograph on internal derangements of the knee-joint (1933) I expressed the opinion that no case could be made out for regeneration of the semilunar unless an experienced surgeon, having carefully removed the cartilage, finds at a second operation that a structure resembling the semilunar has been reconstituted. A short time after making this statement two cases of apparent regeneration of a semilunar cartilage came under my personal observation.

CASE RECORDS

CASE 1.—A professional football player was brought to me in November, 1929, and gave the following history. Three years previously an operation was performed upon the right knee for "removal of internal semilunar cartilage." In October, 1929, while playing football, he received a severe blow on the outer side of the right thigh while the right foot was planted firmly on the ground; the thigh was apparently rotated violently inwards upon the fixed leg. There was severe pain, a fairly convincing history of mechanical locking, and, subsequently, a large synovial effusion. Pain and weakness of the knee had persisted in spite of physical treatment.

On examination, synovial effusion of moderate degree was present and tenderness over the external semilunar cartilage. Flexion was painful, restricted, and associated with the click or snap so often present with a semilunar cartilage lesion. Operation was performed by me one week later and a complete bucket-handle lesion of the external semilunar cartilage was found. The whole of the torn cartilage was very carefully removed with the exception of the extreme posterior portion. Progress was uneventful and the knee functioned perfectly for three seasons.

On Nov. 18th, 1933, while playing football, his right knee was injured in a very similar manner to the previous occasion. Mechanical locking again occurred. X ray examination revealed some degree of lipping of the outer margin of the tibial condyle, and two loose bodies, one in front of the tibial spine and another at the back and outer side. It was considered that the symptoms were due to the loose bodies and operation was performed on Dec. 19th, 1933. The joint was opened through a curved incision over the antero-external aspect and a dense fibrous structure exactly similar in naked-eye appearances to the external semilunar cartilage and presenting a

longitudinal (bucket-handle) fracture was noted. It is of considerable interest to note that at the first operation, three years before, a similar type of lesion of the external semilunar cartilage was found to be present. The major portion of the regenerated and refractured cartilage and also the loose bodies were removed. No microscopical examination was made in this case.

CASE 2.—A professional football player severely twisted his left knee on Christmas Day, 1928. Severe pain was experienced on both inner and outer aspects of the joint but apparently there was no mechanical locking; a large synovial effusion ensued. He abstained from playing for ten weeks but every attempt to resume was accompanied by pain on both inner and outer aspects of the joint, and by synovial effusion.

On examination, May 13th, 1929, there was slight effusion in the left knee and slight limitation of full flexion of the left knee associated with pain. There was a well-marked click or snap on the outer side of the joint on flexion and also tenderness over the external semilunar cartilage and wasting of the quadriceps extensor cruris. The X ray showed an osteophyte growing from the inner surface of the *internal* tibial condyle. The case was clearly of a complex nature and it was considered that the symptoms referred to the inner side of the joint were probably due to interference with the action of the tendons of the sartorius gracilis and semitendinosus from the presence of the osteophyte, and that the symptoms referred to the outer side were due to a lesion of the external semilunar cartilage.

Operation upon the left knee was performed on June 25th, 1929. The osteophyte on the inner side was first removed by the chisel through a small internal incision. A separate incision was next made on the outer side of the joint and the condition of the external semilunar cartilage investigated. An oblique fracture at the junction of the middle and posterior thirds was discovered and the cartilage completely removed. Blood-stained synovial effusion was present and a few melon-seed bodies. The joint was closed after irrigation with normal saline solution.

Subsequent progress was uneventful and he resumed playing in the autumn and continued normally until March, 1934, when during a game he received a fresh injury to the left knee, which was severely rotated. A painful mechanical block to complete extension supervened immediately, followed by synovial effusion of moderate degree. On examination a few days later, synovial effusion was marked. There was a slight mechanical restriction to complete extension and localised tenderness over the middle of the external lateral ligament where also some structure (? cartilaginous) could be palpated and rolled under the examining finger. X rays showed a faint shadow which it was thought might be a loose body in the postero-external compartment of the joint.

CASE 2.—Regenerated external semilunar cartilage. Above = anterior; below = posterior.

A second operation was performed on March 24th, 1934. I used my semilunar skin flap on the outer side of the joint, which was opened by capsular incisions anterior and posterior to external lateral ligament. It was at once apparent that the symptoms were caused by a lesion of a regenerated external semilunar cartilage. This lesion was of the bucket-handle type but affecting the posterior part of the semilunar. The "handle" lay wedged between the external condyles of the tibia and femur where from its position it caused a mechanical block to complete extension and calcification had occurred in this portion, accounting thus for the shadow seen on X ray examination. The movable body felt beneath the external lateral ligament was the outer or peripheral portion of the bucket-handle. Only the anterior part of this is shown in the Figure; it had the normal attachments but was about half the width of the normal cartilage and its inner portion was thin and semitransparent.

Just as one swallow does not make a summer, so is it impossible to establish a fact of considerable importance by experience gained from two clinical cases. This short paper is contributed with the hope that it may stimulate discussion among other surgeons who have special experience in knee operations.

Dr. L. W. Proger, the pathological curator of the Royal College of Surgeons, has kindly examined microscopic sections of the regenerated semilunar cartilage, but excluding the area of calcification, and reports that these show nothing but dense fibrous tissue.

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HISTIDINE IN THE TREATMENT OF GASTRIC AND DUODENAL ULCER

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DURING the months August–December, 1935, twelve consecutive cases of gastric and duodenal ulcer admitted to the Grimsby and District Hospital were submitted to a new routine treatment in order to test the value of histidine as a curative agent.

TREATMENT

On admission, if radiography with barium meal, and if a fractional test-meal, in conjunction with the gastric history and symptoms, pointed to the presence of an ulcer, the histidine treatment was carried out as follows:—

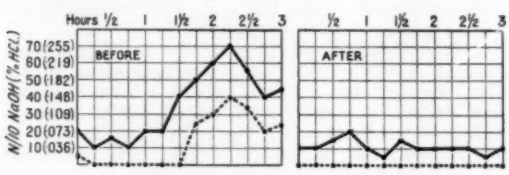
A light solid diet with meals at the usual time was given. Patients were encouraged to take exercise on the ward balcony daily, and they were not confined to bed, being allowed up in the ward. Smoking in moderation was not prohibited.

Daily intramuscular injections of 5 c.cm. of Larostidin were given into the buttocks, 25 injections being given in all. Small doses of alkalis were prescribed at the beginning of the course when there was pain after meals, but were rarely necessary after the tenth day. At the end of the course control radiograms and fractional test-

HISTORY, DIAGNOSIS, AND RESULTS OF HISTIDINE TREATMENT

No.	Age.	Date of admission: symptoms.	Findings.	Condition at end of treatment.	Condition on April 1st, 1936.
1	40	August 12th, 1935: Pain 2 hrs. after food, severe at night; anæmia.	Duodenal ulcer.	Cured.	No pain; very fit indeed.
2	32	Nov. 25th: Persistent "gastric" trouble for years, with treatment; very little freedom.	Gastric ulcer; very high gastric acidity.	Complete relief.	1 mth.'s freedom, but pain has returned.
3	43	August 12th: Very severe epigastric pain for 10 wks., typical of gastric ulcer.	Large gastric ulcer on lesser curvature.	No symptoms except for occasional water-brash. Ulcer still found in radiograms.	Very fit; eats anything. No indigestion or pain.
4	69	Oct. 17th: Years of gastric trouble with loss of weight, and pain 2½ hrs. after food.	Duodenal ulcer.	Much better.	Pain returned 1 wk. ago but not so severe as before.
5	32	August 8th: "Acute indigestion" 6 mths., with pain 2 hrs. after food.	Pyloric ulcer; high gastric acidity with climbing curve in test-meal.	Cured, but high resting acidity remained.	..
6	27	Dec. 16th: Severe pain 20 mins. after food, with acid eructations. Anæmic.	Gastric ulcer.	Symptoms cured.	No further trouble.
7	45	Oct. 15th: Pain 4 hrs. after food. Melæna.	Duodenal ulcer.	Symptoms cured.	..
8	43	Dec. 16th: Persistent pain after food; sudden onset and melæna.	"Hour-glass" stomach; high acidity with climbing curve. Pyloric ulcer.	Better.	..
9	38	Nov. 25th: 8 yrs., symptoms of duodenal ulcer.	Duodenal ulcer with high acidity.	Cured.	Gained 1st. in weight. No further trouble.
10	50	Sept. 30th: Years of epigastric pain, always ½ hr. after food; two hæmatemeses.	Pyloric ulcer; high climbing curve, gastric acidity.	Better.	Pain now as bad as ever.
11	49	Sept. 2nd: Pain ½ hr. after food, with persistent nausea.	Gastric ulcer.	Symptoms cured; ulcer not seen in radiograms.	Very fit indeed.
12	68	Nov. 12th: Admitted as emergency with hæmatemesis; long history of gastric trouble.	Gastric ulcer; hæmatemesis treated on usual lines, followed by larostidin; very high gastric acidity.	Symptoms cured; gain in weight.	No further trouble.

meals were repeated. All the patients treated were men of the labouring class. The whole course averaged a month. The series of 12 cases are recorded in the Table, with a brief history, the diagnosis, and the results obtained; the Figure shows the typical fall in gastric acidity.



Effect of histidine on gastric acidity.

RESULTS

Symptomatic relief was obtained in all cases, and there was an invariable fall in gastric acidity. Of 9 cases followed up 6 were fit and well after 4–6 months, whilst in 3 there had been a return of symptoms.

ADVANTAGES

Compared with the ordinary medical treatment for ulcers—namely, four weeks in bed on a graduated diet—the new treatment has the following advantages. It is far more congenial to the patient whose only inconvenience is the daily injection. There is no irksome diet of ten days of citrated milk and a graduated diet with prolonged confinement in bed. The treatment is also far simpler, with less trouble to the nursing staff, and the time taken is slightly less than the diet treatment.

CONCLUSIONS

Results obtained in the series show at least a temporary loss of symptoms comparable with those obtained by ordinary medical treatment. It is doubtful if histidine has any healing effect on the ulcer directly, its action probably being a reduction in gastric acidity and a lowering of gastric motility. The ulcer has therefore a chance to heal, as the irritative factors are removed with a consequent loss of symptoms. Although not actually confined to bed the patients were not performing the heavy work to which they were accustomed and this also no doubt aided recovery.

There are distinct possibilities for this form of treatment, particularly among sedentary workers. An ambulatory treatment of ulcer could be carried out while they perform their usual daily routine, thus avoiding in many cases the loss of time of an enforced rest of over a month. The course of injections can be repeated if there should be an exacerbation.

Compared with the dietetic method, the cost of treating ulcers on the above lines was found to be about the same or a little less, since the average time taken in hospital was shorter, which helped to balance the cost of the larostidin. To the patient, however, it was a saving, for a normal life could be entered upon as soon as the course was finished, without the necessity of a convalescence period.

It does not seem possible that a lasting cure is to be obtained from histidine as from any other form of medical treatment for chronic ulcer similar to those in the cases recorded, but it is a form of treatment which I found gave satisfaction to both patient and physician.

I wish to record my thanks to Dr. J. W. Brown, honorary physician to the Grimsby and District Hospital, for permission to publish these cases admitted under his care.

WEIGHT OF THYROID GLAND AND ATHERO-SCLEROSIS

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Working as pathologist in Iceland I have been struck by two things which apparently were different from what I had seen on the continent (in Austria and Denmark): (1) the small size of the thyroid gland; and (2) the rarity of athero-sclerosis. During the past year I have weighed most of our thyroid glands in order to obtain knowledge of its average weight in healthy Icelandic persons.

According to Thomas [1] the thyroid gland weighs 3 g. at birth, decreases during the first year of life to weigh 2 g. after twelve months, but has regained its initial weight of 3 g. at 3 years. From this age it increases in weight by 1 g. per year until 25 years, and in the following 10 years by 3 g. Wegelin [2] finds the weight of the thyroid almost constant from 20–50 years, Jaffé [3] also. In order to determine the normal weight for grown-up people in Iceland I have taken the average weight of thyroid glands in this age-period. Our findings are as follows:—

	Average weight of thyroid gland in grammes.
20 females, aged 20–50 years	11·3
14 males, „ „ „	14·9
57 males and females above 20 years of age	13·3

The numbers are not great, but they reflect no doubt correctly the state of affairs in Iceland. Among 14 males the smallest gland weighed 7 g., the biggest 24, one 12, and one 13, but all the others 14–16 g. In the women the smallest gland at this age-period was 7 g., the biggest 19 g.; of 20 glands six were below 10 g. In the 61 bodies above 20 years from whom the glands were weighed we found four above 40 g., all in females. Two had Graves's disease (54 and 57 years), the two others were 47 and 67 years of age. These glands were evidently abnormal and not included in the above survey. In three we found glands weighing 21–27 g., one female and two males, one of them a foreigner. In all the other 54 who were 20–70 years of age the thyroid gland was below 20 g.

COMPARISON WITH OTHER COUNTRIES

It is interesting to compare our figures with those of other countries:—

			Average weight of thyroid gland in grammes.
Germany (Vierordt [4])			33·8
„ (Orth,[5] Berlin)			30–60
„ (Weibgen,[6] Bavaria)			37·2
„ (Hück,[7] Kiel and Rostock) ..			20–25
Italy (Castaldi,[8] Florence)			20–25
Switzerland (Rössle,[9] Berne)			37–55
„ („ Basle)			25–30
Belgium (Thomas,[1] Ghent)			20–27
France (Guiart,[10] Letulle [11])			24–25
U.S.A. (Jaffé,[3] Chicago) Whites			28
	♂	♀	
England*	20·5 g.	19·4 g.	20·1
Japan (Horisawa [12]) ..	17·5 g.	15·3 g.	16·4
Iceland	14·9 g.	11·3 g.	12·8

Wegelin attributes the smallness of the thyroids in Japanese to their relatively small body-weight, but this argument is not valid for Icelanders, who are, according to Hannesson's [25] measurements, among the tallest people of Europe.

The question arises which of the above-mentioned figures are to be regarded as "normal" for the thyroid gland. It is evident that Vierordt,[4] in his "Daten und Tabellen," has adopted too high a standard, and most authors now agree that 20–25 g. should be regarded as the average normal weight for grown-up persons. Then the figures from Japan and Iceland would be too low and one might expect symptoms of dysthyreosis among these nations. As to Iceland, signs of this are unknown, and basal metabolism is on much the same level as in other countries. The fact that we have two cases of Graves's disease among 286 autopsies might point to a tendency to hyperthyreoidism, but our figures are too small yet to permit a judgment on that point.

FACTORS INFLUENCING SIZE OF THYROID

We know that the goitre districts in Europe, North America, Asia, and Africa are practically all in the inner parts of the continents (in England, Derbyshire). Although the problem of ætiology is still a matter of controversy, the theory of iodine deficiency, advanced by Chatin [13] 80 years ago, seems to be better founded than any other. The exact investigations of v. Fellenberg [14] on the iodine-content of food and drinking-water in the goitre-free La Chaux de Fonds, in comparison with the conditions in the goitrous Signau in Emmenthal showed the far greater iodine intake in the goitre-free La Chaux de Fonds. McClendon and Hathaway have shown the inverse relation in North America between goitre and iodine in food and drink, and Hercus, Benson, and Carter [15] have demonstrated the relationship between iodine in soil, plants, and animals, the iodine content of human food being chiefly dependent on the soil from which the population is indirectly nourished. The introduction of iodine admixture to the salt in goitrous districts has given good results, and the evidence is already becoming overwhelming that iodine deficiency plays the foremost rôle among the causal factors of endemic goitre.

Although iodine deficiency is the most important causal factor in goitre, other factors may also influence the size of the thyroid gland. Thus Sahovic and Frajnd [16] observed that rabbits fed on cabbage and potatoes developed a bigger and heavier thyroid and showed less increase in weight than those fed on ordinary food, and Webster [17] came to the same result, that cabbage contains a goitrogenous substance, probably a cyanure.

The theory of iodine deficiency conforms well with our findings in Iceland, where iodine intake seems to be unusually great. Iodine is chiefly contained in the sea, and we know that sea-plants and fish are the richest sources of iodine in human food. Icelanders, and particularly the inhabitants of Reykjavik, whence our material is chiefly derived, are great fish-eaters, and as all the population of the country lives along the coast, within 50 miles from the sea, the air must contain relatively much iodine. The New Zealand investigators have confirmed Chatin's findings, that igneous rocks are richer in iodine than sedimentary rocks, and as soil rich in alkaline earth carbonates is particularly active in this respect, the Iceland soil is probably rich in iodine, being alkaline and of volcanic origin.

According to McClendon [18] the Japanese are great consumers of iodine rich seaweeds, and he attributes to that fact the low weight of their thyroids and the absence of goitres. Seaweed was up to this century

* I am greatly indebted to Prof. Turnbull, London Hospital, for permission to publish figures collected from his post-mortem protocols, where the weights of different organs are carefully recorded. These figures are from the 1934 protocol, being the average weights of 52 females and 78 males between 20 and 50 years (4 cases of Graves's disease and 13 glands above 40 g. in this age-period being omitted).

eaten in various parts of Iceland, but its consumption has practically ceased now, so that it cannot be alleged to be of importance in this connexion here. The drinking-water in Reykjavik is exceptionally pure spring water, containing minimal amounts of mineral salts and is practically sterile. Cabbage consumption is minimal compared with other European countries and potato consumption similar if not slightly less than on the continent.

These factors might be of some influence, although fish-eating is probably the all-important factor. Nicolaysen and Lunde, investigating iodine in urine among Norwegians, found people who had one to three fish-meals a week excreting almost double the amount found by those who took no fish.

ATHERO-SCLEROSIS

Another thing which is striking when autopsies here are compared with what one sees on the continent is the rarity of athero-sclerosis. I have tried to compare our findings with those of other pathologists, but such comparison involves a considerable difficulty, as atheromatosis (= lipoid infiltration) and athero-sclerosis (= lipoid infiltration + calcification) are not always clearly distinguished. In our cases we have noted as atheromatosis lipoid thickenings of the intima and as athero-sclerosis where hard, calcareous patches were found. From our records I find the following figures on changes in aorta :—

Age.	Athero-sclerosis.	Athero-matosis.	No changes (smooth aorta).	Not noted.	Per cent. athero-sclerosis.	
					(*a*)	(*b*)
30–39	1	1	16	20	11·0	5·3
40–49	2	1	19	26	13·7	6·3
50–59	6	1	15	19	31·8	17·1
60–69	9	2	11	12	50·0	32·4
70–79	14	—	1	5	93·0	70·0
80–89	3	—	—	3	—	—

The true percentage must lie somewhere between those in columns (*a*) and (*b*) in which the " not noted " cases are excluded and included respectively.

For comparison the findings of atheromatosis in fallen soldiers by Mönckeberg [19] :—

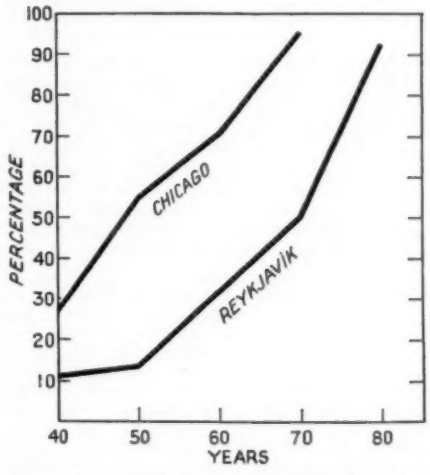
Years of age.	Showing athero-sclerosis. Cases.	Number.	Per cent.
Under 20	14	5	36
„ 25	45	34	76
„ 30	20	18	90
„ 35	15	12	80
„ 40	16	16	100
„ 45	1	1	100

Aschoff adds that other pathologists have found similar figures. Rosenthal [20] studied athero-sclerosis of aorta in 500 autopsies in Chicago in white and coloured persons. The negroes showed higher figures of sclerosis than the whites. As this author has divided his cases into three groups, (1) those with smooth aortas, (2) slight athero-sclerosis, and (3) severe athero-sclerosis, his findings are comparable with ours. The following Graph shows athero-sclerosis found by him in 306 whites and our findings, whereby our higher figures are taken (from column (*a*)).

This graph shows the great difference between athero-sclerosis in Iceland and Chicago, and, as above mentioned, the figures for other countries do not appear to be lower than those for Chicago. It must be noted that in most of our cases, up to 70 years of age, the sclerosis found is only slight, or a few calcareous patches in the aorta.

DISCUSSION

Although our material is not yet great, it is evident that the Icelandic population has (1) an unusually small thyroid gland, and (2) an unusually low rate of athero-sclerosis of the aorta. Athero-sclerosis of other arteries is also relatively rare. The question arises whether there is a causative relationship between the small thyroid and the low sclerosis-rate. Experimentally athero-sclerosis can be produced, in rabbits, by injection of adrenaline (Josué [21]) and by feeding with irradiated ergosterol (vitamin D). Liebig [22]



Percentage of athero-sclerosis found post mortem at various ages in Chicago (Rosenthal) and Reykjavik (Dungal).

administered diodyl to rabbits during the feeding with cholesterol and thereby prevented or diminished atheromatosis in aorta and liver. Binet [23] has shown that potassium iodide and albumin-iodine have the same effect. Murata [24] has shown that atheromatosis may be prevented in rabbits by feeding thyroid gland substance. On the other hand, Pusch has shown that arterio-sclerosis is four times as frequent with goitres as with non-goitrous glands.

Probably the explanation for these conditions in Iceland is the abundance of iodine in our food, particularly the fish, which is consumed in relatively great amounts, but partly also by the iodine in air and soil which in all probability is great. In this connexion it may be mentioned that the Icelandic people ranges high in physical and mental powers. The question then arises whether the normal weight of the thyroid gland is not lower than that generally accepted, and whether a low degree of iodine deficiency is not more widespread than we think it is.

SUMMARY

The weight of the thyroid gland in Icelanders between 20–50 years of age is for males 14·9 g. and for females 11·3 g. Average weight for 57 persons over 20 years of age was 13·3 g. Athero-sclerosis in the population is unusually rare, and it is probable that abundance of iodine in food, soil, and air is the cause of both these phenomena.

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CLINICAL AND LABORATORY NOTES

SUBCUTANEOUS EMPHYSEMA OCCURRING SPONTANEOUSLY IN A CASE OF PULMONARY TUBERCULOSIS

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The patient is a man aged 37, known to have been suffering from pulmonary tuberculosis since an initial hæmoptysis in 1930. He has twice been in sanatoria, and when last discharged in July, 1935, had extensive, rather chronic involvement of the upper halves of both lungs, with a large cavity in the right apex and tubercle bacilli in his sputum. His condition tended to deteriorate about the beginning of 1936, when he steadily lost weight and complained of abdominal symptoms.

At 1 A.M. on April 3rd, while sitting by the fire, he was seized by a pain in the right side and a "freezing" sensation which caught his breath. He felt ill and went to bed, and about an hour later became conscious of a fullness in the neck, which by daylight had become so pronounced that he thought he had "caught the mumps." He called in his private doctor, who found that the swollen tissues gave on palpation the crackling sensation characteristic of subcutaneous emphysema.

I was not at once informed of the condition and did not see the patient until April 8th, when the emphysema had reached its maximum. The bloated appearance of the patient was most striking, and crepitus was elicited over an area extending from both sides of the face as far as the temples, over both sides of the neck anteriorly to the second rib on the left and to the costal margin on the right, posteriorly to the angle of the scapula on the right, including the axilla and upper six inches of the right arm. There were no physical signs of pneumothorax and the patient seemed fairly comfortable. From that time the infiltrating air began to subside, leaving the neck first and the right side of the thorax last. On April 21st no crepitation could be felt and the patient expressed himself "fitter than ever since leaving the sanatorium." The X ray appearances at this time showed no striking changes from a previous film taken a year before. There was no sign of any pneumothorax. Now, about six weeks later, the patient is clinically in about the same condition that he was nine months ago. His alarming experience has left no obvious ill-effect. He himself believes that it has done him good.

Spontaneous subcutaneous emphysema, as distinct from the interstitial emphysema which may occur following external trauma, surgical operations (especially tonsillectomy [1]), and the induction of artificial pneumothorax,[2] is a not infrequent complication of parturition [3] and of acute respiratory disease. It was found in 11 out of 1701 cases of influenzal bronchopneumonia during the 1918–19 epidemic,[4] and has from time to time been reported in connexion with bronchial asthma,[5] pulmonary emphysema, and acute pneumonia, particularly during childhood,[6] often with a fatal termination.

As a complication of pulmonary tuberculosis it is said by Fishberg [7] to be "very rare." It was first described in this connexion in 1919 by Chifoliau,[8] and only three subsequent cases appear to have been reported, by Pick [9] in 1925, by Meade and Stafford [10] in 1930, and by Dobbie in this journal last February.[11] In Chifoliau's case, air was liberated into the subcutaneous tissues from a superficial cavity adherent to the chest wall, and from thence spread over the thorax. Dobbie's case and Pick's case were clinically similar to that at present under discussion; in the former dyspepsia proved fatal 58 hours from onset. The case of Meade and Stafford was preceded or accompanied by the formation of a spontaneous pneumothorax on the left side; this was relieved by thoracotomy, after which the subcutaneous emphysema spread so widely and so embarrassed the patient that it became necessary to release the air by multiple skin incisions, which was followed by tardy recovery.

Theoretically, there are two possible routes by which air may pass from the lung to the subcutaneous tissues:—

(1) Intrapleural, through a breach in the visceral pleura and subsequent perforation of the parietal pleura from the pneumothorax so formed. An extravasation through adhesions between the pleuræ, as in Chifoliau's case, is not, strictly speaking, intrapleural.

(2) Extrapleural, in which air escapes from the lung along the course of the blood-vessels to the posterior mediastinum and from thence to the superior mediastinum, to appear first in the lower part of the neck. This route was demonstrated by Berkeley and Coffen [4] at autopsy on several of their cases of broncho-pneumonia. At the peripheral lung border they found ruptured emphysematous bullæ, from which "air streaks" led through the vessel sheaths; on squeezing the lung under water with the pleura intact, bubbles of air appeared profusely at the hilum.

Spontaneous subcutaneous emphysema arises in the majority of cases probably by the extrapleural route; this can explain satisfactorily most cases due to non-tuberculous disease and also Pick's and Dobbie's cases. Meade and Stafford suggested that in their case the air escaped both intra- and extrapleurally, that the pneumothorax restrained by pressure any further passage of air to the hilum, and that relief of this pressure by thoracotomy allowed the extrapleural leakage to proceed.

In the present case, widespread tuberculosis in both lungs must have caused subpleural erosion at some point. Instead of perforating the pleura, with the formation of a spontaneous pneumothorax, the air passed by vessel sheaths to the mediastinum, and thence to the subcutaneous tissues of the neck. Heal-

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ing of the ruptured surface and absorption of extravasated air resulted in recovery within three weeks.

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TORSION OF THE VERMIFORM APPENDIX ASSOCIATED WITH PREGNANCY

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ON mechanical grounds alone, from its position and structure, the vermiform appendix appears to lend itself to torsion. The condition is, however, exceedingly rare, and a careful search reveals only a single case reported in English—that described by McFadden[1] in 1926. In neither English nor continental medical literature have I been able to trace its occurrence during pregnancy. In view of this, the following case-note may be of interest.

A primigravida, aged 22, was admitted to Mile End Hospital on Feb. 11th, 1936, with the history that she had been awakened 38 hours before by very severe periumbilical pain. She had vomited several times without relief. The pain was still present, had not radiated, and at the time of admission was but slightly less severe than at onset.

Examination.—Well-nourished young adult. Pulse-rate 100. Temperature 100° F. Blood pressure 128/80 mm. Hg. Slight malar flush. Tongue very furred and dry. Nothing abnormal noted in thorax.

Abdomen: uterus 26 weeks' size—i.e., corresponding to the period of amenorrhœa. Left occipito-anterior presentation; head not fixed. Fœtal heart heard, the rate being 130. Great tenderness on either side of the umbilicus, right rather more than left, and associated with some rigidity of the right rectus.

Diagnosis appeared to rest between acute appendicitis and red degeneration in a small intramural fibroid.

A blood count by the Mile End Group Laboratory just before operation gave a white cell count of 18,000 per c.cm., of which 91·5 per cent. were polymorphonuclears, 6·5 per cent. lymphocytes, 1·5 per cent. monocytes, and 1·5 per cent. basophils. The Schilling hæmogram gave a toxic index of 0·7.

Operation.—Abdominal section was decided upon, and after premedication with morphine sulphate gr. ¼ and hyoscine hydrobromide gr. 1/100, a right lower paramedian incision was made under spinal anæsthesia (percaine 14·2 c.cm.). The uterus was normal. The cæcum was brought into the wound and the appendix, pre-ileal in position, was found to have become twisted through two and a half turns about a point half an inch from the proximal end. The distal portion of the appendix, 3¾ in. long, was gangrenous. The appendix then proceeded to unwind itself slowly without mechanical aid. Appendicectomy was performed and the abdomen closed.

Microscopical investigation of the appendix by the L.C.C. Central Histological Laboratory showed "purulent peritonitis over a dilated, necrosed, and engorged appendix."

Despite intensive medication with sedatives, labour began and the patient delivered herself of a 27 weeks' miscarriage eleven days after operation. Convalescence thereafter was quite uneventful.

I am indebted to Dr. Alan Randle, superintendent of Mile End Hospital, for permission to publish this case.

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REVIEWS AND NOTICES OF BOOKS

Treatment of Venereal Disease in General Practice

By THOMAS ANWYL-DAVIES, M.D., B.S., M.R.C.P. Lond., Director, L.C.C. Whitechapel Clinic; Consulting Venereologist to the L.C.C.; Lecturer in Venereal Diseases to London Hospital Medical College. London: John Bale, Sons and Danielsson Ltd. Pp. 202. 7*s.* 6*d.*

ONE of the disadvantages of increasing specialisation in medicine is the danger that the general practitioner may lose touch with modern methods of treatment in certain highly specialised branches, especially when, as in the case of venereal diseases, references to these subjects in current medical periodicals are relatively infrequent. This small and readable manual from an authoritative source should do much to counteract this tendency in relation to the treatment of these infections.

Dr. Anwyl-Davies has succeeded in compressing a remarkable amount of important matter into a limited space, and has presented facts in a clear and interesting way. The chapters dealing with the treatment of syphilis are particularly good. The various remedies are enumerated and discussed, and the methods of administration described. Principles of treatment, dangers, and precautions are well set out; and practical schemes of treatment adapted to the individual needs of patients and to the different stages of the disease are suggested. On the more controversial subject of gonorrhœa description is wisely confined to the methods which the author himself favours, but in respect of these practical detail is not spared. The treatment of less common venereal infections is briefly summarised.

Certain blemishes detract from the general excellence of the work; among them is a tendency to the use of a loose terminology, especially in reference to pathological and metabolic processes. "Paralysis of the liver" is not a scientific or even an accurate description of the toxic effects of the arsenobenzenes upon the liver cells; and the statement that "alcohol . . . reduces the antigenic properties of the blood," even if it were correct, is hardly relevant to its context. Occasionally, too, the author's enthusiasm for some particular form of treatment outruns his discretion in recommending this treatment for general use. For example, however good may be the results obtained by experts, the practice of treating acute gonococcal cervicitis and salpingitis by the intra-uterine instillation of glycerin would be dangerous in unskilled hands. The statement that the dosage of non-detoxicated gonococcal vaccines varies from 5000 million organisms to a maximum of 80,000 millions is probably the result of a printer's error, but it might lead to unfortunate results if accepted and applied by the practitioner. Apart from such errors, which are very few in number, this book is a most welcome addition to the small number of practical manuals on this subject.

Poverty and Health

By G. C. M. M'GONIGLE, M.D., D.Hy., D.P.H., and J. KIRBY, M.R.S.I. With a foreword by Sir F. GOWLAND HOPKINS, O.M. London: Victor Gollancz Ltd. 1936. Pp. 278. 6s.

IT is right and necessary that medical men working in the distressed areas should make known their views on unemployment. Dr. M'Gonigle is medical officer for Stockton-on-Tees, and his book, written in collaboration with Mr. J. Kirby, is intended to bring the problem of malnutrition more urgently before profession and public. After pointing to the unsound physical condition of the population, as indicated by the unfitness of recruits to the Services, the authors turn to the state of the children and provide an interesting chapter on the examination of child welfare records. The essential part of the book, however, is based on Dr. M'Gonigle's well-known observations on a population removed from a slum area to a new housing estate. By this translation the rents of the families were increased by 4s. 4d. per week, thus reducing the margin available for food. To malnutrition is attributed the subsequent increase in the crude death-rate from 18·75 to 26·71, and "approximately a four-fold increase on a normal expected death-rate." The objection to this argument is that the findings are based on too small a sample. The population at risk was only 710, on which population the crude rates quoted show 13 and 19 actual deaths—figures which are insufficient for valid deductions. Incidentally the actual causes of death might well have been set out so that their relation to nutrition might be considered.

This reliance on small samples affects also other of the conclusions drawn. Thus comparisons are made of death-rates of employed and unemployed based on populations of 1564 and 1572. There are shown crude death-rates of 25·47 for unemployed and 17·1 for employed, and standardised rates of 29·29 and 21·01, and these latter are compared with expected rates of 8·75 and 8·53. Dr. M'Gonigle and Mr. Kirby may well refer to the figures as startling; but are they justified? For any validity the calculation needs to be made from a much wider basis. The conclusions have to be set against such a statement as the following, from the Registrar-General's Decennial Supplement England and Wales, 1931 (Part I.).

"The following comparative figures (Table P) indicate the relation of the recent experience in these sections to that disclosed by the 1921 investigation. It will be seen that in the Northumberland and Durham County Boroughs there has been a substantial improvement at all the ages shown in the table except at age 20 in the case of females. This is a matter of high importance as proving that the death-rates in the worst years of the economic depression and in an area ranking among those most severely hit by that depression exhibit no increase. On the contrary the mortality experience in this section is lighter than that disclosed by the previous decennial investigation, and on the analogy of the national experience there is reason to believe that if research were carried back sufficiently far it would be found that in the years 1930–32 the mortality experience of the County Boroughs of Northumberland and Durham was lighter than that of this area in any corresponding period in the present century."

Table 50 of the book sets out various income scales and corresponding death-rates as means of a four-year period. The figures show a variation of crude death-rate from 30·96 at 25s. to 35s. per week to 9·00 at 75s. or over per week, and a variation of standardised rates from 25·96 to 11·52. The populations in the five groups vary from 1187 to 132. The population in the highest grade is 140, and the crude death-rate is 9·00, which represents 1·26 deaths per annum. We do not doubt the accuracy of these data, but it seems to us that, with so small a population observed over so short a time, it cannot be concluded that the observed numerical differences represent real differences in the mortality of the contrasted categories. The figures are suggestive, but the deductions must be tentative.

Less controversial are the chapters devoted to food and family budgets and expenditure. These show an intimate knowledge of social conditions and the detailed analysis of expenditure merits careful perusal. They are a revelation of how the poor live. The various necessary items of expenditure apart from food are given, and Tables 46 and 47 show food expenditure in ingredient value and in quantity. The main point brought out, and which has been elsewhere emphasised, is the shortage of protein, and no one can doubt the importance of laying stress on this, especially in relation to the growing organism. It may be noted, for example, that the weekly amount of fresh milk purchased per man-value in the lowest income group was only 0·55 pints; this may be related to C. M. Burns's investigation of the consumption of milk by 1000 families in County Durham which showed "the figures for whole milk purchased are appallingly low, ranging from 0·25 pints to 0·005 pints per head per day."

As we have said, the conditions of the distressed areas must somehow be brought home to the mind and conscience of the more favoured population. Too many of us have still a quite inadequate appreciation of the circumstances; Jarrow and Oxford-street are in different worlds. It is not surprising that the authors of this book, confronted by the problems presented in a district of heavy and continued unemployment, should be oppressed by their urgency; probably they could say with the Psalmist "The zeal of thine house hath eaten me up." But their deductions seem to us incompletely justified by their data. The book therefore should be read, but it should be read critically.

The Operations of Surgery

By R. P. ROWLANDS, M.S., F.R.C.S., late Surgeon to Guy's Hospital; and PHILIP TURNER, B.Sc., M.S., F.R.C.S., Consulting Surgeon to the Hospital. Eighth edition. Vol. I. London: J. and A. Churchill Ltd. 1936. Pp. 1045. 36s.

HOWEVER skilful he may be the young surgeon must often be conscious of his lack of experience; not so much when performing an operation for the first time as in selecting the cases suitable for surgical treatment and avoiding the "wrong 'uns." It is in this respect that the advice of a senior colleague may be so helpful, and the most valuable attribute of "Rowlands and Turner" is that it provides a written substitute for the wise counsellor. In the final production of this volume Mr. Philip Turner has been deprived of the collaboration of Mr. R. P. Rowlands, who died while this eighth edition of the work was in course of preparation. He has been fortunate in obtaining the assistance of Mr. W. H. Ogilvie and Mr. Grant Massie, who have undertaken the revision of the chapters on the vertebral column and the lower extremity, and a determined effort has been made to maintain the high reputation so justly enjoyed by the earlier editions of "Jacobson." The sections of the book

which deal with the surgery of the limbs required very little revision, and the new matter added by Mr. Grant Massie on the lower extremity has been clearly set out, though it might have been an advantage to include rather more detail about the indications for the orthopædic operations, and fuller descriptions of those for various forms of talipes.

When bringing out another edition of a well-established text-book it must be hard to decide how much to keep of the old and how much to add of the new in surgery. For the most part Mr. Turner's decisions have been wise, and adequate accounts are given of plastic operations, recent experience of the use of radium in carcinoma of the tongue and of the breast, cervico-thoracic ganglionectomy, and the recognition and removal of tumours of the parathyroid gland. On the other hand, commonly accepted innovations in the surgery of cervical rib, ankylosis of the jaw, thyroglossal cysts, and the thyroid gland are omitted; the chapters on the brain and on the thorax are lamentably out of date; and it is high time that longitudinal incisions in the neck should be condemned in any but the most exceptional circumstances. Criticism must also be directed at the references to the literature which supply volume and page but no date. A large number of these references are very old, and it is essential that the reader should be able to distinguish them from the more recent ones. The book has been to so many surgeons a wise and trusted friend that those who are entrusted with maintaining its fine traditions have a special responsibility.

A Manual of Physics

Fourth edition. By J. A. CROWTHER, Sc.D., F.Inst. P., Sometime Fellow of St. John's College, Cambridge; Professor of Physics in the University of Reading. London: Humphrey Milford, Oxford University Press. 1936. Pp. 585. 14*s*.

THIS manual, now in its fourth edition, has an established place in the presentation of elementary physics. The new features now incorporated lie for the most part in the electrical section where good accounts are given of methods of production of X rays and their physical properties, and of natural and artificial radio-activity. Prof. Crowther has found it necessary to enlarge the section on alternating current, and the result is a very readable and instructive account of electro-magnetic induction and the practical applications which have led to the devising of such a variety of different instruments. The book can be recommended without qualification; it is attractively written, comprehensive, and accurate.

Introduction to Human Parasitology

Fifth edition. By ASA C. CHANDLER, M.S., Ph.D., Professor of Biology, Rice Institute, Houston, Texas. New York: John Wiley and Sons, Inc.; London: Chapman and Hall Ltd. 1936. Pp. 661. 25*s*.

THE scope of this book is wider than that of most works on human parasitology. The subject has been divided into three main sections, dealing respectively with protozoa, helminths, and arthropods. Within these sections the chapters have been arranged in a systematic manner, either from the standpoint of zoological classification or from that of effects on the host. While it has obviously not been the author's intention to give a complete account of all the parasites dealt with, detailed descriptions and figures have been supplied where two important species have to be differentiated—e.g., between *E. histolytica* and *E. coli*, *T. solium* and *T. saginata*, and *X. cheopis* and *X. astia*. Additions made during the last few years to our knowledge of human parasitology have been numerous and important. Particularly extensive changes have been required in many chapters of this book, notably those dealing with spirochætes, amœbæ, malaria, rickettsias, flukes, strongyloides, filariæ, and myiasis; and in many places complete rewriting and rearrangement have been necessary in order to give an adequate and well-coördinated presentation. Throughout the book special emphasis has been laid on the biological aspects of the subjects. Considerable space is devoted to life-cycles, epidemiological factors, and interrelations of parasite and host. Specific and detailed directions for the treatment of the parasitic diseases have been excluded, but the underlying principles of treatment and prevention are discussed. Since it is difficult to go very far into such a vast subject as parasitology within the limits of one book, Prof. Chandler has included a list of the leading journals and standard works which cover the field. His enthusiastic outlook is refreshing. The book is well produced and clearly printed with numerous effective diagrams.

Psychology and Religion

By DAVID FORSYTH, M.D., D.Sc. Lond., F.R.C.P., President of the Section of Psychiatry, Royal Society of Medicine; Consulting Physician to Charing Cross Hospital. London: Watts and Co. Pp. 221. 7*s*. 6*d*.

THE discussion of the conflict between science and religion has moved far since the days of Huxley. The earlier concentration on the historicity of the Bible, the testimony of the rocks as against the cosmology of Genesis has more or less ceased, at least outside fundamentalist circles. But with the challenge of anthropology and psycho-analysis the problem has assumed a new and more cultural guise. Religion could stand up to the theory of the evolution of the species, but the real test is whether it can stand firm when psychology and anthropology allege that man's moral and social nature evolves from lower to higher forms. The theory that man passes from a religious to an artistic-philosophic and thence to a scientific level of enlightenment was the view of Auguste Comte. But he did not have a Tylor and Frazer, a Westermarck and a Freud to give chapter, verse, and punctuation to support his views.

In this book Dr. Forsyth builds almost entirely on Freud's theories of the development of the child mind and his theory of social origins. No one will deny that Freud's œdipus complex has illuminated the dynamics of the mind and incidentally the origin of society and its usages. But while the Cyclopean family is even to Freud a speculative concept, it is not easy to accept the corollaries of this idea, as applied to human society and its institutions. Moreover, it is not logically sound to equate the imaginative ideas of simpler peoples with the illusory. Religious ideas and folk practices were the ways in which the simpler peoples dealt with the world and their own relations; it was in short their social science. It must be agreed, however, that the abundant use of magic and of some forms of religion is no longer serviceable to humanity and can be positively harmful; for example, its extension into patriotism can

have devastating international effects. Furthermore, Dr. Forsyth is not always up to date in his psychoanalytic data, and perhaps on this account he makes a simple process of what is now known to be a very complex one even in the child mind—i.e., magical thinking and its fructifying effects. Religion is shedding and will doubtless contrive to shed many of its primitive notions, and its anthropomorphisms. But there are some who will for epochs to come continue to feel awed by nature and moved by that "oceanic feeling" which Freud claims he has never felt.

Cystoscopy and Urography

Second edition. By JAS. B. MACALPINE, F.R.C.S., Hon. Surgeon and Surgeon in charge of the Genito-urinary Department, Salford Royal Hospital, Manchester. Bristol: John Wright and Sons, Ltd; London: Simpkin Marshall Ltd. 1936. Pp. 478. 30*s*.

NINE years have elapsed since the first appearance of this book, and nine years is a long period in the history of urology. Many new methods of examination have been introduced, the most notable being excretion urography. These advances have necessitated the inclusion of three entirely new chapters dealing with excretion urography, pyeloscopy, and pelvic resorption. Of these the first is the most important, pelvic resorption being mainly of scientific interest, and pyeloscopy a method of examination which, though excellent in principle, is difficult in practice. As the author points out, the presence of a foreign body (the opaque fluid) in the ureter excites efforts at expulsion, and the appearance of the pelvis and calyces under these artificial conditions cannot be regarded as physiological. Moreover, few clinicians have the time or the experience necessary to interpret the constantly and quickly changing shadows seen on the fluorescent screen.

Mr. Macalpine writes clearly, and does not overload his text with theories or quotations from other authorities. His book is eminently practical, and with its help those who have limited experience of cystoscopy and cystoscopic methods will be able to improve their technique and increase their knowledge of cystoscopic conditions. The coloured plates are of a high order, so also are the reproductions of pyelograms illustrating the section on pyelography and excretion urography.

Disease in Childhood: The First Year

A Clinical Study. By ROBERT S. FREW, M.D. Edin., F.R.C.P. Lond., Physician to the Hospital for Sick Children, Great Ormond-street. London: Macmillan and Co., Ltd. 1936. Pp. 669. 30*s*.

THE age-incidence of disease is a study which has hardly received the attention it deserves, and in reading the preface to Dr. Frew's work one is struck by the good fortune of a physician privileged to see all out-patients in age order for a period of seventeen years. Unfortunately, however, it soon becomes obvious that when the first year of life is subdivided into three age-periods even statistics based on 8823 consecutive cases under 12 years of age, provide a quite inadequate basis for discussion of any except the commonest disorders of childhood. Dr. Frew has not, in this book, supplemented his own experience to any considerable extent by quotations from recent medical literature. This is the more unfortunate because his own views on pædiatric pathology are unconventional. He attributes many of the disorders of childhood, with the exception of tuberculous meningitis, to a condition which he calls "hyperphlebæmia." It would be wearisome to enumerate all the diseases, from laryngismus stridulus to early pulmonary fibrosis, and from cretinism to cœliac disease, which he finds due directly or indirectly to this cause. "A bewildering array of clinical manifestations" seems, under the circumstances, a cautious understatement. With sledge-hammer logic the author proceeds to apply an Alice-in-Wonderland system of pathology to treatment, with results such as the following: "If, when the baby is born, . . . he is suffering from 'white asphyxia,' the cord should be severed without ligaturing and bleeding promoted by every available means" (p. 144). Similarly after concluding that a failure of the ductus venosus to close at birth is the most likely explanation of "status lymphaticus" (with the cautious proviso that when the opportunity arises, this point will naturally be investigated with great interest), he says: "If this be the ætiology of the disease, then in cases where a thymic shadow is found, I imagine it will not be beyond the skill of the surgeon to ligature the ductus venosus under local anæsthesia before a general anæsthetic is administered" (p. 564). It is difficult under the circumstances to appreciate the few jewels that undoubtedly exist in a somewhat fantastic setting. The book is well printed and contains a number of excellent illustrations.

Treatment of Fractures in General Practice

Pocket Monographs on Practical Medicine. Second edition. By W. H. OGILVIE, M.D., M.Ch., F.R.C.S. London: John Bale, Sons and Danielsson. 1936. Pp. 180. In two volumes. 2*s*. 6*d*. each volume.

WE welcome the second edition of these two small green volumes on fractures. It is an achievement to have compressed so much information into small compass and yet to have produced a text easy and pleasant to read. The first part of the work, which covers the 58 pages of Vol. I., is devoted to the general principles of fracture treatment. The enumeration of the headings and subheadings from page 21 onwards still seems to us somewhat unsatisfactory; in all other respects the meaning is clear and the description of methods of treatment concise and easy to follow. From the practitioner's point of view it is an advantage that Mr. Ogilvie describes only methods of proven value, the apparatus for which is readily available. For fractures of the upper limb, for example, the moulded plaster-of-Paris splint is described and illustrated. Skeletal traction is recommended in fractures of the lower limb, but methods of skin traction are also described, and the practitioner is advised to use these where the case is being nursed under less ideal conditions. It is interesting to find an account of a serviceable method of treatment by continuous traction of fractures of the neck of the femur; this is recommended for use in very feeble patients. The operation described for this fracture is by the Watson Jones modification of the Smith-Petersen's pin fixation. In general, however, open operation for fractures is properly relegated to a secondary position.

This excellent monograph is worthy of a place in the surgery of every practitioner and in the pocket of every student.

THE LANCET

LONDON: SATURDAY, JUNE 13, 1936

CARE FOR THE DEAF

ON Thursday the National Institute for the Deaf celebrated its silver jubilee with the opening by H.R.H. the Duke of YORK of new headquarters at 105, Gower-street, London, W.C.1. An appeal is being made by Lord CHARNWOOD, the president of the Institute, for larger support of a movement which during its 25 years of existence has proved the necessity of the objects for which it exists and justified the energy with which the officiate has laboured to overcome great difficulties. The first of those difficulties is the general apathy, due to lack of information, displayed by the public in regard to the position of the deaf in the community. Year by year at annual meetings of the Institute the case of the deaf has been brought forward with the intention to show how vastly the deaf can help themselves, if only they meet with help from their more fortunate brethren, and to illustrate how large is the range of activities along which the deaf can prove themselves valuable citizens, when the courtesy and patience necessary to bring about normal intercourse are extended to them. Reasoned advocacy along these lines has produced during the existence of the Institute practical results. Associations made up of representatives of deaf societies and of public authorities have been established in many areas, covering indeed England and Scotland, and similar centres it is to be hoped will soon be established in Wales and Northern Ireland. Such public and private movements have produced many beneficial results, among others the vital one of the placing of many deaf in employment. But the aims of the Institute cannot be fully realised till adequate provision is made for the training of the adolescent deaf, for their re-training when necessary, and also for the replacing in suitable work of adults who have become deaf through disease or accident. Lord CHARNWOOD, an untiring public servant, points out in his jubilee appeal that these developments will entail the strengthening of voluntary societies to fit them for larger responsibilities, while districts in which the interests of the deaf are still unrepresented by any society must be stimulated to play their part.

No special legislation exists to protect the interests of the deaf, apart from that which entitles deaf children to suitable education. Their cause has been the concern of the National Institute, a voluntary body, and of its affiliated associations and voluntary local societies. The Institute maintains three organisations for deaf women and working deaf boys, and acts as a clearing house for the work of the county associations. Its scope is largely administrative and will be found well set out in its publication "All About the Deaf."[1] Here will be seen how the deaf are helped and how they may help themselves. And in this publication Lord CHARNWOOD draws the valuable if self-evident distinction between the case of those deafened through injury or disease and those born deaf, in whom the prevention of deafness has not to be considered. The only State inquiry into the conditions of the deaf made during the last 50 years was summarised in a report by the late Dr. EICHHOLZ in 1930. But this document, though embodying the result of the first investigation of the State into the needs of the deaf over school age, paid little attention to the needs of the deafened, who form a much larger class than the born deaf. The Institute desires to see the compulsory school age lowered to five years for children born deaf; for their investigations prove that, if speech is to be acquired by deaf-mutes in a way to fit them for playing their part in national life, it must be acquired young. Relegation of education until the age of seven is extremely unfortunate. Further an extension of suitable educational opportunities for school leavers is needed, while another just reform among the objects of the Institute is the granting of earlier old-age pensions to those who through deafness are unable to support themselves by their own labours. This would bring the treatment of the deaf into line with that of the blind, and to be deaf is as much a deprivation as to be blind. The sad case of the blind is spectacular; that of the deaf must go without public notice.

Other aims of the Institute, emphasised by Lord CHARNWOOD in his appeal, are, first, the maintenance for both sexes of hostels for the adolescent deaf similar to those for homeless deaf boys successfully established at Highbury; and, secondly, the establishment of homes to receive the adult deaf on the lines of the Institute's homes at Bar wford in Lancashire and Poolemead in Somerset. In these places the inmates are made happy through being able to communicate with one another and with the trained staffs; while to lessen the hardship of isolation—the heaviest burden which the deaf subject has to bear—the Institute has started lip-reading classes at its headquarters for the deafened generally. In these and other ways the headquarters of the Institute has become a clearing house for all matters connected with the deaf. In close touch with the principal deaf societies throughout the world, it has established with them a systematic exchange of the latest results of research into deaf problems of all kinds. Through a skilled staff and a medical committee of distinguished aurists; an executive committee on which are represented the regional associations, the London County Council, the associations of county councils, many municipal corporations and education committees, various local deaf societies, the National College of Teachers of the Deaf, and individual members of both Houses of Parliament, the Institute is in close touch with the Ministries of Education, Health, and Labour. It is thus able to combine research and organisation on a national scale with individual help to the deaf in all parts of the United Kingdom.

[1] London: The National Institute for the Deaf, 105, Gower-street, W.C.1. 1934. Pp. 122. 3s. 3d.

All this in 25 years. But much remains to be done. Probably there are some 40,000 deaf-and-dumb persons among us and perhaps two million seriously deaf. The helping of such a population is a gigantic task and at every step the Institute has been hampered in its efforts by lack of adequate funds. Its new headquarters, made necessary by the rapid growth of its services, should be freed from debt, and this burden now stands at £8000. But for the extension of its labours, if only along the lines already laid down, at least £50,000 is required. To find this sum the jubilee appeal approaches the public with confidence. It is after all a small sum that is asked for when compared with the benefits conferred on a section of society who especially deserve help from the community, if only because of the return which when helped they can make.

MICE AND MEN

ALL who are interested in epidemiology and scientific medicine will welcome a report by GREENWOOD, BRADFORD HILL, TOPLEY, and WILSON, which has just been published by the Medical Research Council.[1] For nearly twenty years one or more of this team of statisticians and bacteriologists have been producing papers on the spread of epidemics under controlled conditions among herds of mice. In the present report they conveniently summarise the results of their previously published work and add some new observations, including an account of epidemics of the virus disease of mice known as ectromelia. It is possible here to mention only a few of the more important conclusions that are to be drawn from this continuous study of mouse infections. One of the most remarkable findings is that, although under certain conditions waves of mortality may be separated by quiescent periods, yet infection of a herd with *Bacillus aertrycke* (mouse typhoid) or *Pasteurella muriseptica* will never die out so long as fresh susceptible mice are added at intervals. The continuity of infection between separate epidemic waves is maintained by chronic infections among the more senior mice which have survived one or more waves of mortality. These survivors are nevertheless not permanently immune to the specific infection and will ultimately die of it if they remain in the infected herd. Their failure to establish a permanent immunity is somewhat unexpected in view of the usual assumption that repeated antigenic stimuli, natural or artificial, will always increase specific acquired immunity. In this connexion TOPLEY has shown that repeated injections of an *aertrycke* vaccine, after first raising the resistance of mice, are ultimately followed by a fall in the degree of resistance, as though the specific defence mechanism had been exhausted. If the mice entering an infected herd have previously been protected by inoculation their expectation of life is increased; but their artificial immunity—like that acquired by exposure—does not save them from eventually succumbing to the specific infection. At the same time we must not allow the relative failure of "antityphoid" inoculation in mice to discourage the use of human anti-enteric vaccines; for, as the authors say, "neither war, nor the absence or breakdown of adequate sanitary control among a civilian population, is at all likely to produce conditions so severe as those to which our herds of mice are continually exposed." Hence it is the partial success in protecting mice that deserves chief emphasis. Nevertheless this work makes it easier to understand why we cannot hope ever to produce an absolute immunity against enteric diseases by inoculation alone and must always supplement it by adequate sanitary measures. The virus diseases present a rather different problem. In ectromelia, as one would expect from human epidemiological experience of viruses, a period of survival in an infected herd leads to immunity of a much higher order than is attained with the bacterial disease, mouse typhoid. In fact, mice which survive exposure to ectromelia for more than 65 days are found to have an expectation of life not very much less than that of normal uninfected control animals.

The authors of the report discuss whether the relatively greater resistance of the survivors of an epidemic is due to the selection of mice with a greater innate, or genetic, immunity or whether it is attributable to an acquired specific, or non-specific, resistance through contact and sublethal infection with the specific epidemic or other bacteria. Their experience leads them to favour specific acquired immunity as the most important factor, though others have also some weight in determining the length of survival in the infected herd. Thus a striking series of investigations revealed a class of mice that appeared to be immune to natural contact infection by virtue of some innate physiological peculiarity through which the bacilli were prevented from gaining access to their tissues. Such mice do not acquire a specific immunity; for when they are infected by parenteral injection of *B. aertrycke* they show themselves as susceptible as others. They present an interesting analogy to the children who do not catch diphtheria during years of close contact with carriers and cases and yet, despite this close contact, never develop diphtheria antitoxin in their blood, and are in addition very difficult to immunise artificially. The report also describes investigations showing that infectivity, the ease with which a parasitic microbe spreads from host to host, and virulence, the power of killing or injuring the host species, are separate characters which can vary independently, though as a rule highly virulent organisms are also more infectious than the average. Such bacteria, with a greater virulence and infectivity than ordinary endemic strains, may be termed epidemic strains. TOPLEY and GREENWOOD made an observation of fundamental biological significance when they were able to trace the evolution of an epidemic strain of *B. aertrycke* during an epidemic which had been initiated by a strain of ordinary virulence. The recent exacerbation in the prevalence and severity of diphtheria in certain localities is probably a

[1] Experimental Epidemiology. By M. Greenwood, A. B. Hill, W. W. C. Topley, and J. Wilson. Med. Research Council, Spec. Rep. Ser. No. 209. 1936. Pp. 204. 3s. 6d.

similar phenomenon, caused, in the first place, by the origin of epidemic strains of diphtheria bacilli—the so-called "gravis" and "intermediate" variants of *Corynebacterium diphtheriæ*. The very nature of the problem makes it hard to obtain satisfactory evidence that differences in type of epidemic are in great part due to variation in the characters of the specific micro-organisms. L. T. WEBSTER, an American experimental epidemiologist of wide experience, has been so impressed by the negative results of his own investigations on this point that he is loth to admit that microbic variation plays any important part in the genesis of epidemics. It is therefore refreshing to hear TOPLEY and GREENWOOD and their colleagues boldly state that "variations in the character of a bacterial parasite may well be of decisive importance in the secular history of any epidemic disease." Of course there is no implication in this statement that microbic variation is "a frequent concomitant of the evolution of a single epidemic wave."

Assuming that bacteriophages are specific viral parasites of the corresponding bacteria, D'HERELLE and his followers' suggestion that human infections might be eradicated by the introduction of a suitable bacteriophage is not such a wild speculation as it may appear at first sight; it finds a parallel for example in the successful control of certain agricultural plant diseases by spreading the parasites of the pests themselves. So far, however, experimental epidemiology has produced no evidence in favour of the theory, and specific bacteriophages apparently have no influence on the course of a mouse-typhoid epidemic. In writing of this result TOPLEY and GREENWOOD cite the interesting "all or none" effect which was found by ANDREWES and ELFORD, who working with a coli-phage mixture showed that there was no appreciable killing of the bacilli until the bacteriophage exceeded a certain concentration; but once this critical concentration of "phage" was reached the destruction of the colon bacilli was almost complete. Accordingly the failure to discover any effect of bacteriophages on mouse-typhoid epidemics does not necessarily mean that dramatic benefit might not follow the employment of other phages or other techniques. Negative results were also obtained in experiments planned to determine whether variation in the diet and its vitamin content would affect the mortality of infected herds of mice. These findings will cause surprise and disappointment among those who hope that the prevention of ill-health, including infectious diseases, mainly depends on raising the standard of diet and nutrition. But, so far as it has yet gone, experimental epidemiology supports the opinion of many field epidemiologists that diet is of little or no importance in determining the incidence or severity of epidemic diseases unless there is gross lack of vitamins, or frank starvation, among large sections of the population.

As is only to be expected, the investigations described in this report provide a model of the experimental and statistical technique involved in the analysis of herd diseases or epidemics. It illustrates the caution and restraint that are required in interpreting the results of an experiment, the care needed in providing adequate controls, and the necessity of having a sufficient number of animals if, to quote the authors, the research worker is to avoid "basing conclusions upon data that will not bear their weight, and so adding further confusion to problems that are already obscured by a mass of ill-founded hypotheses."

THE BRITISH ASSOCIATION

BLACKPOOL has been chosen as the meeting-place of the British Association in September. It is a town whose civic authorities have made a successful study of modern amusement, and a scientific survey of Blackpool and of the Fylde, of which it is the centre, must have particular interest. The town has made remarkable experiments in street lighting and in the solution of the traffic problem which has baffled so many places which have the advantage of four points of the compass instead of three. Such a survey, which is now part of the Association's programme, will be an attractive number of a series which now includes York, Leicester, Aberdeen, and Norwich. The surveys of Leicester and Norfolk were in fact reprinted for educational use at the instance of the local authorities. Even a cursory examination of the programme for the Blackpool meeting suggests that the demand, especially vocal within the last two years, for the payment of more systematic attention to the bearings of scientific progress upon the welfare of the community, will be met this year. We do not yet know the precise content of Sir Josiah Stamp's presidential address on the evening of Sept. 9th, but as it will deal with the impact of science on society, we may be sure that it will include some of the economic and social problems which are troubling our minds. Since the centenary gathering in London in 1931 the annual meeting has never attracted less than two thousand enrolling members, apart from those who are drawn to one or other of its more popular items. The sectional transactions cover a large range of subjects, and this year for the first time a programme is indicated for those who would make an orderly study of scientific investigation in its bearing on the life of the community. Such communications, which are starred in the programme, include an address by Prof. Allan Ferguson on trends in modern physics, by Prof. J. C. Philip on the training of the chemist for the service of the community, by Brigadier H. S. L. Winterbotham on mapping of the colonial empire, by Prof. W. Cramp on the engineer and the nation, by Mr. J. Ramsbottom on the uses of fungi, and finally one by Prof. J. Hendrick on soil science in the twentieth century. Among the starred discussions are subjects such as economic problems affecting Lancashire, scientific problems of the poultry industry, road research and traffic problems, climate and health, social and cultural values of science, and, most appropriately, engineering problems of mass amusement. This closer coördination of work for the advancement of science is putting a severe strain on the economic position of the Association, and in the Five Years' Retrospect just issued it is pointed out that further endowment will be essential to consolidate the position it has attained at the close of its first century, and that expansion of membership and strengthening of financial foundations should be the object of all who would further its interests.

ANNOTATIONS

THE INITIAL STATE PRINCIPLE

IT is a commonplace that a stimulus applied to a functional unit may evoke different results under different conditions. The experimental method eliminates difficulties due to the environment in so far as this can artificially be kept constant, but the immediate environment of a normally functioning organ is the rest of the body, and the experimenter can therefore never guarantee that the organ is more than approximately in the same state on different occasions. Most workers perform a "control" or dummy experiment in which the conditions are exactly the same as in the real experiment, with the exception that the stimulus is omitted. If the two experiments are run in parallel, the state of the organ in the control animal serves as a zero from which the response of the organ in the experimental animal can be measured. Only rarely is any interest evinced in the fluctuations of this zero; their existence is recognised purely in order that they may be fairly neglected in evaluating the response. On another page, Prof. S. Leites advances cogent reasons why these fluctuations should be regarded as of interest in themselves, and not merely as an experimental nuisance. Once the nature and "normal" magnitude of the response to a given stimulus have been determined, variations from the normal in individual cases should give information about the condition of the organ in question, if the relation between magnitude of response and the "zero state" is understood. This also seems a commonplace principle, and it is easy to cite instances, such as the sugar-tolerance test and renal functional tests, where it is used in practice. It is nevertheless true that a great deal more is known about the relations between all kinds of stimuli and their appropriate responses, than about the relations between the responses and the state of the organs which give rise to them. We take it for granted, for instance, that if an organ is in the same condition all the time the magnitude of the response varies as the strength of the stimulus. But if the response to the same stimulus varies from time to time, the most we can say is that the "condition" of the organ is also varying; no simple rule springs to the mind telling us just what alteration has taken place when the response increases or decreases. In certain cases we know from experience what has happened, but we have no general law.

The "initial state principle" of Prof. Leites represents an attempt to fill this gap, and recalls Weber's law of sensation. In its simplest form it states that the more excited an organ is to begin with, the less it will react to an exciting stimulus by increased activity, and the more readily will it react to a depressant by decreased activity. Prof. Leites points out various pitfalls which must be avoided in applying this principle, the chief of which is the temptation to employ a criterion of activity which is not strictly related to the stimulus. He points out its potential importance in investigating organs influenced in opposite senses by the sympathetic and parasympathetic systems respectively, in which a state of diminished activity may be due to overaction of one or underaction of the other. Numerous examples are given to illustrate the operation of the principle, but it must be stated that in one or two cases alternative explanations appear more likely, and the argument would have been strengthened by their omission. Although it is not at present possible to accept without reserve any simple generalisation, there can be no doubt that the relation between response and initial state is a field of research which must be thoroughly explored in the near future. Perhaps the most exact investigation bearing on this point is that recently made by Prof. A. V. Hill and his co-workers [1] on the electrical excitation of nerve. They find that while the stimulus is rising to its full strength, the nerve is becoming less excitable, so that the adequacy of a stimulus depends not only on its ultimate strength, but upon the speed with which this is attained. Unless the stimulus rises more rapidly than the excitability of the nerve falls, it is ineffective. The mathematical expression of this relationship is by no means simple, and foreshadows difficulty in the treatment of systems where measurements cannot be made with the same degree of precision.

PROGNOSIS IN CANCER OF THE BREAST

NOTHING is more widely known about the prognosis of mammary cancer than that even after radical operation it is very much worse when there are axillary metastases. Dr. Channing Simmons [2] has found in a series that he has been studying that the average length of history when there was axillary involvement was six months, only three months more than the history of uncomplicated cases. This observation was contributed to a discussion on cancer of the breast held by the New England Surgical Society at Manchester, New Hampshire, and it is very significant. It means that, once carcinoma has appeared in the breast, it may be a matter only of weeks before it produces metastases. The prognosis of radical mastectomy is therefore entirely dependent upon early diagnosis, but, according to Dr. H. G. Jarvis, who opened the discussion, neither factor has shown definite progress in the last 15 years. Dr. Jarvis gave the figures for the Hartford Hospital. Out of a total of 320 cases, 266 (80 per cent.) were operable; 54 (20 per cent.) were inoperable, and at the end of five years all of these were known to be dead. Of the operable cases, 60 per cent. were dead and 40 per cent. alive. There was not a complete follow-up in the operable cases, only 82·5 per cent. having been traced. One contrast was significant; of 83 patients who had been operated on at a stage when cancer was limited to the breast, 42 were alive at the end of five years and without evidence of recurrence, whereas only 24 of 96 patients who had early metastases apparently limited to the axilla were alive and free of cancer five years after operation. So important does Jarvis consider early diagnosis that he believes that it is the responsibility of the surgeon to explore every case of tumour of the breast, even when the tumour is only suspected. Early and adequate treatment is not, however, the only factor in prognosis that Dr. Jarvis and the other speakers recognised. The pathologist at the Hartford Hospital has classed into three grades of malignancy 193 cases that have been followed for five years. In Grade I., that of lowest malignancy, 22 out of 23 patients without metastases were alive at the end of that time, and 5 out of 8 in those with metastases. Of 42 Grade II. patients without metastases, 28 were alive, but none with metastases had survived the five years. Grade III., the highest

[1] Proc. Roy. Soc. B., 1936, cxix., 305.
[2] New England Med. Jour., March 12th, 1936, p. 501.

degree of malignancy, was represented by 8 patients, none with metastases, of which 5 had survived for five years. In this series therefore the patient with a Grade I. carcinoma and no metastases had a more than 9 to 1 chance of living for five years. Grade I. cases with metastases had as good a chance of survival as those without metastases in either of the other grades—about 6 to 1. G. C. Wilkins and G. F. Dwinell quoted results from the Elliott Hospital. Of 62 patients whom they had traced since their operations during 1919–1930, 35 per cent. were now known to be well; 50 per cent. were "five year cures"; and 18 per cent. "ten year cures." These two surgeons were convinced both of the inadequacy of clinical methods for diagnosing cancer in an early stage, and also of the importance of biopsy for every tumour of the breast. Pre-operative and post-operative radiation are employed by them as a routine, and they hope that the increased dosage now used will result in an improvement within the next five or ten years. Dr. Simmons, on the other hand, had employed pre-operative radiation in a series of cases and was not inclined to agree that it increased the prospects of cure. All the speakers preferred operation, whether combined with radiation or not, to radiation alone. They stressed how important it was that women should report any abnormality of the breast, and the responsibility that rested on the practitioner to countenance no delay in having the abnormality thoroughly investigated.

THE TRENDELENBURG OPERATION FOR PULMONARY EMBOLISM

THE publication of a successful operation for embolism of the pulmonary artery by Valdoni [1] of the Alessandri clinic is of special interest, for this is the first successful operation of the kind in one of the Latin countries. Since Trendelenburg first performed the operation in 1908, it has been carried out successfully only in its country of origin and in Sweden (Kirschner 1, Meyer 4, Nystrom 2, Craaford 3).

Valdoni's patient was a man of 68 who was 14 days convalescent from an operation for a left inguinal hernia. While walking along a corridor he was seized by intense pain in the chest, fell to the floor and rapidly became unconscious. He was seen three minutes later and immediately removed to the operating theatre. In the Alessandri clinic a set of Trendelenburg instruments is kept in readiness, and seven minutes from the onset of the embolism the incision was made. The patient was deeply unconscious and anæsthesia was superfluous. The 2nd, 3rd, and 4th costal cartilages were removed, the pericardium incised, and the heart exposed. Irregular contractions of the organ were still present, and dilatation of the right heart and prominence of the pulmonary artery were apparent. The Trendelenburg sound was passed, a rubber tube introduced into the transverse sinus, and the pulmonary artery incised. There was a rush of dark-coloured blood with some fragments of clot. The embolus forceps were introduced and a 27 cm. clot was removed from the left branch of the pulmonary artery. At this point the patient stopped breathing and artificial respiration was begun. A second large clot was then removed from the right branch of the pulmonary artery and the incision closed by lateral application of the special Trendelenburg clamp. The heart now began to beat more strongly and normal respiration was resumed. The pulmonary artery was repaired by suture; it proved impossible to close the parietal pericardium, but the superficial wound was repaired in the usual way. Towards the end of the operation the patient began to regain consciousness. For some days there was evidence of a disordered cardiac action, but after a course of rest and digitalis he left hospital cured.

[1] Valdoni, P.: Policlinico, May 18th, 1936, p. 911.

Wustmann and Hallervorden [2] have recorded the experience of the Frey clinic with the operative treatment of pulmonary embolism during the last two years. In all, 6 cases were subjected to operation; it is worth noting that the diagnosis was correct in each case and that in one there had been a smaller embolus two days before the fatal attack. In 3 patients death had come very suddenly, and when the heart was exposed at operation all signs of cardiac action had ceased and attempts at revival proved fruitless. The 3 remaining patients, although the clot was removed and effective cardiac action restored, survived only for a limited period—36 hours was the maximum. In all 3 cases death resulted from failure of the central nervous system, which had suffered irreparable damage during the initial period of heart failure.

Of recent years some authorities have doubted the practical value of the Trendelenburg operation. There can indeed be few operations so open to reasoned and informed criticism. At the same time it should be remembered that the victim of a massive pulmonary embolism dies of heart failure, and, although only 11 patients have permanently survived after operation, in at least another 35 normal cardiovascular action has been restored. Success demands experience both in diagnosis and in operative technique, but given these it seems imperative that the operation should be attempted, for apart from its value to the individual patient each success is important as a demonstration of the possibilities latent in modern surgical technique.

HISTIDINE TREATMENT OF PEPTIC ULCER

THE experimental basis for the use of histidine in the treatment of peptic ulcer has been subjected to severe criticism. No one studying the original observations upon dogs could feel convinced that any amino-acid deficiency was actually present in these animals or that the ulcers produced were strictly comparable to the chronic ulcer of man. Hence the widespread employment of histidine has been chiefly founded, empirically, on its apparent power to relieve the symptoms of ulcer in man, as in the short series of cases reported by Dr. Gardiner on p. 1352 of our present issue. But now from America come reports of similar symptomatic improvement from the intramuscular injection of distilled water or saline. Sandweiss [3] giving a daily injection of 5 c.cm. of distilled water to 20 ulcer patients found that 12 became symptom-free (5 after the first injection) while corresponding improvement was noted in only about the same proportion of patients treated with histidine (22 out of 40). Martin [4] observed relief of symptoms in 3 out of 6 patients following saline injections. Even so few observations as these suggest that histidine can hardly exercise a specific effect upon the healing of peptic ulcer, and numerous other non-specific injections have for many years found warm supporters, Sandweiss mentioning as many as eleven. Nevertheless accounts of its beneficial effects continue to appear, and Martin and Sandweiss's papers allow some critical comparison of this method of treatment with the more orthodox diet and alkali régime to be made. On the whole their reports are not favourable. Thus Sandweiss, out of 67 patients, found that of those treated with histidine, 85 per cent. had recurrence of symptoms

[2] Wustmann, O., and Hallervorden, J.: Deut. Zeits. f. Chir., 1935, ccxlv., 472.
[3] Sandweiss, D. J.: Jour. Amer. Med. Assoc., April 25th, 1936, p. 1452.
[4] Martin, K. A.: Ibid., p. 1468.

within six months as against only 31 per cent. of those treated by diet and alkali. In the two treatments about the same proportion became symptom-free, but of 24 patients checked by radiography or operation after histidine treatment, not one showed disappearance of the ulcer deformity. Martin's results in two comparable series of ulcer patients are similar; thus of 32 patients watched for ten months after histidine treatment only 13 have had no recurrence, whilst 16 out of 40 patients treated by diet and alkali are still well after this time, 24 having had relapses. Acting largely upon Dr. Martin's report the Council on Pharmacy and Chemistry of the American Medical Association have postponed further consideration of the use of histidine "until adequate clinical evidence of its therapeutic value" is forthcoming. Their caution emphasises again the need for care in using histidine treatment at the expense of dietary principles that have had longer trial.

OPERATION FOR AURAL VERTIGO

AURAL vertigo is fairly common, but its severity is extremely variable. In many patients the symptoms are not so serious as to interfere greatly with their mode of life and work; these will usually make satisfactory progress with reassurance combined with an occasional course of a mild sedative drug, and there is often a tendency towards spontaneous cure. But some, a minority, lose their morale and are prevented from working by the frequency and severity of the attacks. In such cases operation is justifiable, and intracranial section of the auditory nerve has been shown to lead to dramatic cessation of the vertigo. There is usually severe deafness on the side involved, so that the total loss of hearing which follows the operation is of little moment. In some patients, however, who suffer from Ménière's syndrome, there is no great deafness, and it is highly desirable to save the hearing. This is possible if the vestibular portion of the nerve is divided without damage to the cochlear fibres. Dr. K. G. McKenzie,[1] of Toronto, has now performed this operation on 12 patients; of these, 7 had such poor hearing on the affected side that it was of little importance to save the cochlear nerve, but in all of these such hearing as they had was not further impaired. Of the 5 with useful hearing, in 1 the cochlear nerve was unintentionally cut, and 1 died of wound infection which caused an extradural abscess compressing the cerebellum. In the remaining 3 cases the hearing was not made worse, and all 11 patients lost their attacks of vertigo. A little unsteadiness remained for a few weeks or months but this gradually disappeared, and the only relic of vertigo is a slight tendency, in a few cases, to fall towards the affected side when turning suddenly in the dark.

At operation, access is obtained through an opening over the cerebellum, made as high and as lateral as the lateral sinus and mastoid cells permit. The vestibular portion of the nerve lies above and behind the cochlear portion; a groove or line of cleavage is sometimes seen between the two, but there is no real septum. The vestibular fibres are larger and have a thicker medullary sheath than the cochlear fibres. McKenzie's method is to make a short incision into the centre of the nerve parallel to its fibres, to insert a blunt right-angled hook over the postero-superior half of the nerve which contains the vestibular fibres, and to cut down on to the hook with a sharp knife. It is not necessary to isolate the facial nerve, which lies in front separated from the auditory nerve by the pars intermedia of Wrisberg, and in this respect the operation is easier than when the cochlear nerve, which lies closer to the facial, is divided as well. A further advantage is that it is usually possible to avoid a small artery which runs in the centre of the nerve, but which he has found to lie on the cochlear side of the longitudinal incision.

These cases of aural vertigo nearly always have unilateral deafness and tinnitus, or at least these symptoms are much more severe in one ear, so that there is no difficulty in deciding on which side to operate; in one of McKenzie's cases there was some doubt, but there has been no recurrence of the attacks after operation of the deafer ear. He has found the caloric response of no value as a lateralising sign; the reactions as a whole had a tendency to be subnormal without definite difference between the two sides. The nystagmus, also, had no value in this respect, being sometimes to the sound, and sometimes to the affected side, while in one patient it varied in different attacks. Again, the direction in which objects appear to move was of no assistance; 7 of the 12 patients were unable to give any definite direction; in 3 the objects moved towards, and in 2 away from the side of the lesion. Most preferred to lie on the back, one would only lie on the affected ear, and one was equally emphatic that he could lie only on the good ear. The effect of vestibular section on tinnitus is interesting. Of the 12 patients, 1 died, 1 had a section of the entire nerve, and 1 had no tinnitus; of the remaining 9, 2 had complete cessation, 2 were unchanged, and in 5 tinnitus has much diminished. It may therefore be expected that this symptom will be alleviated after division of the vestibular nerve alone; it is noteworthy that a mild tinnitus has been found to persist in about half the cases treated by complete section of the auditory nerve. As would be expected, caloric response is usually absent after operation, but 2 of McKenzie's patients showed a slight reaction from the vertical canals, which suggests that it is not necessary to cut all the fibres of the vestibular nerve in order to cure the vertigo.

The operation described seems no more difficult than complete section of the auditory nerve, and apparently has several advantages over it, especially when useful hearing remains in the affected ear.

[1] Canad. Med. Assoc. Jour., April, 1936, p. 369.

THE B.P. ADDENDUM

ON the first of this month the eleventh edition of the Pharmacopœia of the U.S.A. came into force. It has been the aim of the British Pharmacopœia Commission to come into line as closely as may be with American practice in the draft for the B.P. Addendum which is now so far advanced that copies may be available in September next, although publication cannot take place before the following December. We have already enumerated [1] some of the more important drugs which are to be described in this Addendum, including five new antitoxic sera. At the meeting of the General Medical Council last month Sir Henry Dale presented a report from the Pharmacopœia Committee calling attention to the prolonged consideration which has been given to the inclusion of the newer remedies which are coming into general use. It was then agreed to reappoint in September, when their present term of office expires, the present eight members of the Commission and to reinforce its special knowledge of clinical thera-

[1] THE LANCET, April 4th, p. 793.

peutics and pharmaceutical chemistry by the addition of Prof. F. R. Fraser who served on the committee from 1928 to 1933 and of Mr. W. H. Linnell, Ph.D., director of the Pharmaceutical Society's chemical research laboratory. It is satisfactory to know that the Addendum is to appear this year. The prodigious gap between the issues of the Pharmacopœia of 1914 and 1932 led to some natural despondency about the way in which the G.M.C. was keeping the official drug list in touch with modern therapeutics, however closely it was observing its statutory duties. We may hope that the interval between successive pharmacopœias will never be more than ten years again.

THE PRINCES IN THE TOWER

Prof. William Wright's Cavendish lecture drew a large audience to the West London Medico-Chirurgical Society on June 4th, and he kept them fascinated by his modern commentary on the tragic story of the Princes in the Tower. The two boys, Edward and Richard, were the sons of Edward IV., and after their father's death the elder (Edward V.) was seized by his uncle Gloucester (afterwards Richard III.), who lodged him in the Tower, ostensibly to be in readiness for his coronation. On June 16th, 1483, he was joined by his brother, the Duke of York, and neither was ever seen again outside the walls. A detailed account of their murder by Gloucester's agents, probably in August or September, 1483, was given by Sir Thomas More in his "Historie of Kyng Rycharde the Thirde" (1513), but its authenticity has been questioned and some have held that Henry VII. killed them after he came to the throne in 1485. A potential source of evidence was the group of bones discovered at the base of the White Tower in 1674 and buried in Westminster Abbey by Charles II.'s orders. These were examined by Prof. Wright in 1933 and he found that they were the bones of two children differing by two or three years in age as judged by the length of their bones. An attempt to fix the age of the elder more precisely was rewarded by the discovery of the second cervical vertebra: the tip of its odontoid process had not united, and from this it could be deduced that the child was less than 13 years old. Assuming its owner to be Edward V., who was born on Nov. 2nd, 1470, he must have died long before Henry VII.'s accession, and there is reason to accept Sir Thomas More's story that they were murdered at the ages of 12 and 10. That the bones are really those of the princes is supported by the situation in which they were discovered and by anatomical signs of consanguinity. These are (1) wormian bones of unusual size and almost identical shape in the lambdoid sutures of both crania, and (2) absence of the upper second premolars in the elder coupled with absence of the lower second deciduous molar in the younger. Absence of deciduous molars is exceedingly rare, and the findings suggest not only tooth-suppression in both children but tooth-suppression in the same regional plane.[1] A remarkable feature of the elder boy's facial skeleton was an extensive reddish-brown stain reaching from just below the orbits to the angles of the lower jaw—a finding consistent with death by suffocation. In Prof. Wright's opinion the evidence that the bones are those of the princes is as conclusive as could be desired and definitely more conclusive than could reasonably have been expected. And if Sir Thomas More's story contains coincidences these are the coincidences of real life, not those of invention.

[1] The investigations are fully described by Mr. Lawrence Tanner and Prof. Wright in "Recent Investigations regarding the Fate of the Princes in the Tower," communicated to the Society of Antiquaries. Archæologia, vol. lxxxiv.

DR. HURTLEY

MANY generations of students at St. Bartholomew's Hospital will learn with regret of the death of Mr. William Holdsworth Hurtley, D.Sc. He first came to the hospital in 1899 as assistant to Dr. Chattaway whom he succeeded as lecturer in 1906, becoming a reader in chemistry at London University in 1922. Hurtley was a teacher who took trouble in the preparation of his lectures and demonstrations with the result that they always fulfilled their purpose. He was a good organic chemist, and although his teaching hours were long he found time for research work, collaborating with the late Sir Archibald Garrod in papers on alkaptonuria and cystinuria. He did original work on the acetone bodies and bile acids, and his study of the estimation of iodine in the blood led to the development of a standard method. At the hospital Dr. Hurtley was beloved by all who came in contact with his courtesy, modesty, and honesty. Of a retiring disposition he rarely emerged from his laboratory, but he would spare unlimited time to anyone who sought his advice on chemical problems. During the last five years, although over the normal retiring age of 65, he reorganised the teaching of biochemistry for the second- and third-year students, and carried through all the arrangements for the new chemical laboratories at Charterhouse-square. He was due to retire at the end of the present session, but did not recover from an attack of pleurisy and bronchitis which befell him in April. He died in the hospital on June 2nd.

THE DANGERS OF THE FEATHER PILLOW

THE risk of a baby suffocating itself in a soft pillow is often considered negligible, and many medical practitioners doubt the possibility of such an accident until they come across an actual example. A tragic case of this sort has lately been the subject of comment by the coroner for East Sussex. A baby of 3½ months was left in its perambulator and found dead with its head buried in a feather pillow. The coroner remarked on the danger of such pillows and also upon the amazing fact that a strong infant may fail to make the necessary movements to free its face. Yet books on the care of infants hardly mention pillows at all and in consulting the standard manuals for mothers one finds no warning in strong enough terms. Unfortunately it is seldom possible for newspaper reports to be certain about all the relevant facts of the case. In the first place the mentality of the infant is seldom mentioned, possibly in order to spare the parents' feelings; yet it is highly important. Medical men who would admit the possibility of self-suffocation by a mentally deficient child hesitate to believe that a normal strong baby can fail to save itself. If soft pillows are dangerous to normal infants, what about blankets and eiderdowns? It might be argued that it is hardly ever safe to leave a baby alone. On the other hand if the risk is only serious when the infant is mentally defective the responsibility of parents or nurses of normal babies is greatly reduced. Another point concerns the possibility of such deaths occurring among those who were formerly supposed to have "status lymphaticus." Certainly this term has been used at some of the inquests, and though it is no longer admissible we may still conceive that some

children are peculiarly susceptible to sudden death from trivial causes. It is interesting that the risk arising from feather pillows should be minimised while those of overlying are generally admitted: and it seems that overlaid babies often die without much protest. The coroner for East Sussex requested the practitioner who was called to the recent case to tell all his patients not to use feather pillows for young children. Substitutes include pillows filled with chaff or hard vegetable flock, or even no pillow at all. Clearly in the present state of knowledge the feather pillow should be barred; but, as already suggested, this knowledge may well be incomplete. It is hard to believe that a normally strong infant relinquishes its hold on life without some effort.

ARTIFICIAL RADIO-ACTIVITY

FRESH from her appointment as under-secretary for scientific research in the new French Ministry, Mme. Joliot-Curie last week gave an address in London on the synthesis of new radio-active elements. The occasion was a meeting at the Wigmore Hall of the Medical Association of the International Clinic at which Lord Lytton presided. Mme. Joliot-Curie began by resuming the results of recent research in atomic physics, which she described as an explosion of new knowledge, international in range. The term explosion may be applied also to the method employed, which is bombardment of normal matter by projectiles of atomic size. The explosion of the naturally occurring radio-active elements has supplied us with alpha and beta rays, and we have long been aware of the fast-moving electron of the discharge tube; but recent investigations have given us the neutron, the hydrogen nucleus or proton, and the positive electron. With these weapons the physicist has attacked the elements, subjecting each in turn to an atomic barrage, knowing that if enough projectiles are fired some hits must be scored. The results of such hits on the nucleus were at first found to be a disruption of the atom struck, with the production of other known elements; later, evidence was forthcoming in some experiments of unstable forms or isotopes of elements, which were of themselves radio-active. When the source of bombardment was removed in these cases, the activity of the treated material continued for a period in diminishing intensity according to the well-known law governing natural radio-activity. These new elements of laboratory manufacture are of such short life that they are unlikely to be found in nature. They have been identified by the use of a Wilson cloud chamber in which their ionising paths are photographed by the tracks of condensed water vapour. The quantities produced are small, so small indeed as to elude the tests of chemistry, but owing to rapid decay the intensity of radiation is by no means negligible. Mme. Joliot-Curie considered the possible medical application of these elements. They are, as she pointed out, of lower atomic weight than those occurring in nature; hence when introduced into the body by injection or absorption they will find their way by the normal chemical reactions to certain organs. Radio-activity may thus be applied selectively, and with agents whose activity is temporary. In support of these speculations she showed some photographs of sections of organs in which radio-activity had been naturally concentrated by biochemical action, the concentration being sufficient to record itself on a photographic plate. Mme. Joliot-Curie concluded by emphasising the contribution of many countries to the growing knowledge of the ultimate structure of matter—a knowledge to which her illustrious mother's discovery provided the key. We may hope that the engrossing work of a new Cabinet department will not divert her energies too far from her own fruitful inquiries.

THE BASIS OF TROPICAL MEDICINE

IN delivering the Stephen Paget lecture of the Research Defence Society last Wednesday Sir Malcolm Watson began by speaking of the way in which Paget gave freely of his time and his money so that research for the cure and prevention of disease might proceed without obstruction. To illustrate the astonishing value of such research in saving life and reducing misery he recounted some of the achievements of tropical medicine, and described in vivid phrases the discoveries of Manson, Ross, and Walter Reed. To Manson he applied Stevenson's words: "Study and experiment, to some rare natures, is the unbroken pastime of a life," and he showed how tremendous an influence such an "enviable nature" may have upon his fellows and their environment. Ross carried on the torch of investigation, and "already we can claim to have saved a million lives and an incalculable amount of sickness" as a direct result of the researches of these two men. In Cuba Reed and his collaborators combined patient inquiry with unforgettable heroism; and some of them lived to see great results from their final proof that yellow fever is carried by a mosquito. To-day their work continues and experimental research on animals provides hope that we shall be able to prevent the spread of this disease into regions like Asia, where it is otherwise capable of spreading through dense populations "as if a fire ran through the prairies."

ON Monday next Prof. J. H. Stokes, of Philadelphia, will deliver the Prosser White oration of the St. John's Hospital Dermatological Society. His subject is the Control of Syphilis, and the meeting will be at 1, Wimpole-street, W., at 5 p.m.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee of this fund 19 new applicants were assisted and 34 grants were renewed to beneficiaries. In all £1346 was voted. The following particulars of a few cases helped indicate the kind of work undertaken:—

Widow, aged 40, of M.B. who died last year aged 39. Her husband had worked as a medical missionary in North China, and she was left with a capital of only £1300, and three children to educate and maintain. Fund voted £26 plus a special gift of £10. The Ladies' Guild will assist with education of children.

Daughter, aged 61, of M.R.C.S. who died in 1927. Her father practised for some 30 years and was much loved by the poor. She has a few pounds only of her own, and makes up her income by needlework; but of late her health has been giving way and she can no longer work eight hours a day at her needle which she has to do if she is to earn enough to keep herself alive. Fund voted £26.

Widow, aged 63, of M.D. who died in 1927. Since her husband's death the widow has endeavoured to support herself. Recently she has held housekeeper's positions, which now through ill-health she finds difficult to get and to hold, age and ill-health being against her. Income £51 per annum. Fund voted £26.

This is the centenary of the fund and a special appeal is being made for new subscribers to raise the annual income, by subscriptions and donations, to £20,000. From the present income of £14,000 allowances of £40 and £26 are made to medical practitioners and their dependants respectively. An appeal is also being made this year for special donations to create a fund from which larger grants can be voted to very urgent and distressing cases, and which may be used to help with the training of the widows and orphan sons and daughters of medical practitioners to enable them to be self-supporting. Cheques should be made payable to the hon. treasurer of the Fund, 11, Chandos-street, Cavendish-square, W.1.

PROGNOSIS

A Series of Signed Articles contributed by invitation

CIV.—PROGNOSIS OF HAND INFECTIONS

HAND infections fall into many different types, the prognosis of each of which must be considered separately. In the first place there are *variations in bacteriology*, the severity of the infection depending upon the organism. Infection of the hand of the surgeon or nurse from a prick during an operation or dressing on a patient suffering from streptococcal or pneumococcal septicæmia may be followed by grave illness and even death. On the other hand, infections with the staphylococcus are not usually dangerous to life.

In the second place there are *variations in the anatomical type of infection* which greatly modify the prognosis, and these will be discussed later. Similarly, *variations in treatment* will have a profound effect upon the course of the infection, and these will have to be considered seriatim. Nor is it out of place to consider prophylaxis in its relation to these infections.

Prophylaxis

Between 5 and 25 per cent. of all disabilities are due to infections of the hand, the proportion varying with the trade of the workman. Removal from one factory of minor causes of injuries (broken tins, baskets, nails, pins) reduced the incidence of injury to less than one-seventh of its previous figure. In another instance the use of tincture of iodine after all injuries reduced the incidence of infections by 38 per cent., and diminished the severity of those occurring. Hospitalisation of all cases were this possible would doubtless still further reduce morbidity. Industrial organisations should be urged to provide instruction and facilities for treatment.

Anatomical Types of Infection

The principal anatomical types of infections will now be considered.

SUBCUTICULAR WHITLOWS

Subcuticular whitlows are little more than infected blisters, and have the appearance of bullæ containing pus. The treatment of the ordinary case is to remove the raised cutis aseptically and apply spirit to the exposed area. During the first few days the edge may continue to "grow," but with further treatment the condition rapidly disappears within 5–7 days. A blister at the base of the finger which becomes infected is more serious, for, the skin being thick, there is a tendency for the pus to track into the subcutaneous tissues forming a "collar-stud" abscess and a whitlow of the second variety.

SUBCUTANEOUS WHITLOWS

These form the biggest group of hand infections. Owing to the density of the fibrous tissue in the pulp of the fingers, the fat is disposed in loculi, which upon infection become extremely tense. The pus ruptures from one loculus to the next, the condition spreading slowly and insidiously, until a considerable portion of the finger is involved. The danger of an expectant policy at this stage cannot be over-emphasised, and continued hot dressings merely serve to conceal the progress of the disease. If the infection begins in the distal phalanx the tension developed is sufficient to obstruct the blood-supply to the bone at an early date, leading to necrosis followed by sequestrum formation, the basal epiphysis being spared longer than the rest of the bone. If the infection involves the proximal parts of the finger, pus may travel via the lumbrical muscle into the thenar or middle palmar space, leading to further complications and corresponding delay in recovery. Furthermore, a neglected subcutaneous whitlow may lead to infection of the tendon sheath, which is extremely grave, or to direct destruction of bone, which also prolongs and increases the incapacity.

For these reasons it is clear that the prognosis of a subcutaneous whitlow is directly related to the stage at which and the method by which the finger is treated. As soon as the condition is diagnosed on the five cardinal signs of suppuration, and long before fluctuation is evident, a free incision must be made under regional or general anæsthesia, with a tourniquet round the arm or the base of the finger. The incision should be placed laterally, and every infected loculus must be drained; horseshoe-shaped incisions over the tip should be avoided as the resulting scar is often unsatisfactory. Twenty-one days should see the finger practically healed. Delay in resolution means that the incision was not adequate, or that some complication has arisen. Palmar and thenar space infections resolve rapidly after appropriate incisions; tendon sheath and bone infections are discussed below.

THECAL WHITLOWS (TENOSYNOVITIS)

These may follow direct infection of the sheath as from a needle prick, or be the sequel to a neglected subcutaneous infection. In the thumb tendon, the infection rapidly passes up to the wrist region, and may then pass down the little finger or vice versa. In the index, middle, or ring fingers the infection may rupture into the thenar or middle palmar space. Profound septicæmia is also to be feared in tendon sheath infections, with all its dangers. Apart from these complications, the tendon itself tends to undergo necrosis at an early date, and later sloughs out completely, leading to complete loss of function of the finger. Bone involvement is also to be feared in neglected cases.

Long incisions along the line of the tendon have been advocated, but in my experience usually lead to prolapse and loss of the tendon, with a functionless finger which too often has to be amputated. Short lateral incisions draining the more dilated parts of the sheath opposite the flexures, with particular attention to the proximal cul-de-sac, may save the finger. In thumb and little finger infections, the common flexor sheath has to be drained above the wrist by lateral and medial incisions. A perfect functional result is sometimes seen, though this is very rare in spite of careful post-operative re-educative exercises. Much more frequently a stiff and possibly deformed finger is the outcome, if indeed it is saved at all. The period of incapacity may be from two weeks to several months, and permanent incapacity is not unlikely.

SUBPERIOSTEAL WHITLOWS (OSTEOMYELITIS)

These may be extensions from any of the foregoing varieties, the result of a compound fracture, or in rare cases, of a blood-stream infection. The disease itself does not produce a high state of toxæmia as is common with osteomyelitis of larger bones, and is

not in itself dangerous to life. Except in metastatic infections and in rare primary infections of bone immediate operation is not called for, assuming that drainage has already been provided. The infection is of a chronic order and one has to wait for the natural processes of sequestrum formation, which may take many months to complete. Nothing is gained by premature interference.

Deformity is to be expected from loss of bone, although new bone may form to an amazing extent, while in cases where the joint surfaces have been involved bony ankylosis is usual. A stiff straight finger is a nuisance to a working man, who may beg for amputation. If the hand has been maintained in the "position of function," wrist dorsiflexed, fingers partly flexed, the deformity is less noticeable and less inconvenient, for a considerable amount of movement is usually preserved at the metacarpo-phalangeal joints. Suppurative arthritis of the proximal interphalangeal joint is a definite indication for early amputation, for otherwise after many weeks of suppuration a stiff finger will be the inevitable result. Most patients prefer to accept a reduction in morbidity at the expense of the loss of the digit.

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(*To be continued*)

SPECIAL ARTICLES

THE FATE OF A POPULATION OF WOMEN MEDICAL STUDENTS

BY M. H. KETTLE, M.R.C.S. Eng.

BETWEEN the years 1916 and 1924 inclusive St. Mary's Hospital Medical School was open to women as well as to men students. Their admission arose from the circumstance that during the war the London School of Medicine for Women (L.S.M.W.) sought relief from the congestion of clinical students at the Royal Free Hospital, while St. Mary's, in common with other London medical schools, was suffering financially and otherwise from their lack. Later, women were accepted, not only for hospital training, but for the whole medical course at St. Mary's until in 1924 for reasons which, it was officially stated, had nothing to do with the efficiency, industry, or conduct of the women students, the decision was taken to admit no more of them.

Altogether, 255 women entered St. Mary's during the nine years.[1] Of these, 222 came for the clinical course only, 210 from the L.S.M.W., and 12 from elsewhere (e.g., Oxford or Cambridge); 2 did *some* pre-clinical work at St. Mary's, and 31 entered St. Mary's for the whole medical course. The students from the L.S.M.W. were in no way selected; they were asked to indicate which of the two hospitals open to them they would prefer to attend, and as far as possible their wishes were met.[2] It seemed likely that an analysis of the subsequent careers of those women who qualified from St. Mary's and of their distribution through various branches of the profession would be of interest, since they provide a complete though small population. They may or may not be a fair sample of all women who entered the profession during the same period, but there is no reason to regard them as atypical. The tables set out below were compiled from the answers to a questionnaire issued on behalf of the St. Mary's Hospital Medical Women's Association in May, 1934, to all the qualified women who could be traced. They were asked to state (*a*) name and address, (*b*) qualifications and diplomas, (*c*) jobs done since qualifying, (*d*) present professional work, if any, and (*e*) whether married; they were also (*f*) given an opportunity, which 88 of them took, to comment on women's work in medicine. Question (*e*) was later supplemented by a query, addressed to those known to be married, about children, in order to ascertain, if possible, to what extent a decision to drop professional work was influenced by the ties of a family.

[1] Three of them, previously enrolled, did not actually begin work until 1925.

[2] Of the first batch to enter St. Mary's, in May, 1916, 4 had already spent one of their clinical years at the Royal Free Hospital and 8 had recently passed the second professional examination. Subsequent batches of students had had no previous hospital experience.

Proportion of Women Qualified

Interest centres first on the proportion of the 255 entrants who achieved qualification. It emerged (Tables I.A and I.B) that 230 (90·2 per cent.) of the entrants became doctors. This is a creditable percentage, but it must be remembered that most of them had already passed two out of the three professional examinations on admission to St. Mary's.

TABLE I.A.—*Proportion Qualified*

—	Alive.	Dead.	Total.
Number of women—			
Qualified	220	10	230 (90·2 %)
Unqualified	21*	4	25 (9·8 %)
Number who attended hospital	241	14	255 (100·0 %)

* 12 of these are known to be married.

TABLE I.B.—*Sources of Information*

Unqualified women—	
Records of St. Mary's Hospital Medical School and private information	25
Qualified women—	
Replies to questionnaire	203
Books of reference, including past and present medical registers, medical directories, and hospital calendars	27 = 255

Of the 25 (9·8 per cent.) who did not qualify, 4 died as students; of the rest, assumed to be alive, 12 are known to be married, some of them giving marriage as a reason for withdrawal. Most of the withdrawals seem to have been during the first or second clinical years.

Qualifications Obtained.—Higher Degrees and Diplomas

Table II.A shows that while 212 women took the Conjoint Board diploma, 77, or more than a third of this number, took a degree also; 15 women took a degree only; 2 took the L.S.A. only; and 1 the L.D.S. only.

Table II.B shows higher degrees and diplomas. Higher degrees in arts and science were ignored because usually there was no indication whether these had been obtained before medicine was even contemplated as a career, but at least one

D.Sc. and one M.Sc. can legitimately be claimed and one general practitioner has become a barrister-at-law. One M.R.C.P. was awarded on published research work, and one F.R.C.S. Eng. is held by a woman who had already gained the university medal in her London M.D. The M.C.O.G. had only recently been established at the time the questionnaire was issued, which may account for the fact that only one holds this diploma.

TABLE II.A.—*Qualifications Obtained*

Qualification.	No. and per cent.
L.D.S. only	1 (0·4)
L.S.A. only	2 (0·9)
L.R.C.P., M.R.C.S. (1 with L.D.S.)	135 (58·7)
M.B., B.S.*	15 (6·5)
L.R.C.P., M.R.C.S.; M.B., B.S.*	77 (33·5)
	230 (100·0)

TABLE II.B.—*Higher Degrees and Diplomas*

	No. and per cent.		No. and per cent.
M.D.*	21 (9·1)	D.T.M. & H.*	7 (3·1)
M.R.C.P.	3 (1·3)	D.P.M.*	6 (2·6)
M.S.	1 (0·4)	D.M.R.E.	3 (1·3)
F.R.C.S. (Eng. 5, Edin. 2)	7 (3·1)	D.O.M.S.	5 (2·2)
M.C.O.G.	1 (0·4)	D.L.O.	1 (0·4)
D.P.H.	26 (11·3)		81 (35·2)

* For simplicity, all degrees are included as M.B., B.S., though a few women qualified from universities with a different designation—e.g., M.B., B.Chir. Similarly all diplomas of tropical medicine (i.e., D.T.M. Liverp.) are included as D.T.M. & H., and the category D.P.M. includes a diploma of psychology gained at Geneva. All but three of the M.D.'s are M.D. Lond.

How Many are Working?

From Table III.A it is seen that of the 230 women who qualified 99 (43·0 per cent.) married and 127 (55·2 per cent.) remained single, the civil state of the remaining 4 (1·8 per cent.) being unknown. Of the single women 111 are working, 1 is doing light work, 7 are for various reasons not undertaking professional work at present,[3] and 7 are dead. Of the 96 *living* married women 46 are working, 13 are doing light work, and 30 are not undertaking professional work at present. The present occupation of the remaining 7 is unknown.

TABLE III.A.—*Numbers Working*

—	Working.	Light work.	Not undertaking professional work at present.	No statement.	Dead.	Total.
Single.	111	1	7	1	7	127 (55·2%)
No statement re marriage.	2	..	..	2	..	4 (1·7%)
Married, without children.	19	3	8	1	..	31 (13·5%)
Married, with children.	26	10	19	2	..	57 (24·8%)
Married. No statement about children.	1	..	3	4	3	11 (4·8%)
—	159 (69·2%)	14 (6·1%)	37 (16·1%)	10 (4·3%)	10 (4·3%)	230 (100·0%)

TABLE III.B

—	Working.	Not undertaking professional work at present.	Total.
Single.	112 (94·1%)	7 (5·9%)	119 (100%)
Married, without children.	22 (73·3%)	8 (26·7%)	30 (100%)
Married, with children.	36 (65·4%)	19 (34·6%)	55 (100%)
	170 (83·3%)	34 (16·7%)	204 (100%)

The proportion of married women *without* children who continue professional work is greater than that of married women *with* children, but only slightly (Table III.A). This is shown more clearly in Table III.B, which is derived from Table III.A by excluding the qualified women who are dead (10) and those about whom no information is available in respect of either marriage, present work, or children (16). This leaves 204 women: 119 single, of whom 112 (94·1 per cent.) are working; 30 married without children, of whom 22 (73·3 per cent.) are working; and 55 with children, of whom 36 (65·4 per cent. are working.

No attempt has been made to estimate the fertility-rate, but excluding adopted (3) and step-children the number of children produced of whom records are available is 117.

Distribution Through the Profession

Table IV.A is an attempt to get a cross-section of the distribution of the qualified women in different branches of the profession at the time of the inquiry, without reference to posts previously held or to future prospects. No account was taken of the (very few) cases where a change was contemplated—e.g., from general practitioner to anæsthetist—or likely to be enforced—e.g., dismissal from a public health appointment on marriage. The group most affected by this rigid interpretation of the information provided is that of "not undertaking professional work at present." Those whose part-time occupations may not depend directly on the possession of a medical qualification, such as lecturing on physiology or hygiene to school-children, welfare societies, or girls' clubs, or dispensing, are categorised as "not undertaking professional work at present." Women who say they do "occasional locums" for their husbands are also placed in this group, which, moreover, may be unduly swollen by the inclusion, besides those definitely on the retired list, of single women who are looking for a practice after several years abroad, such as a professor of medicine at the Lady Hardinge Medical College, India, recently retired; or are taking a long holiday, for example one who after five years as medical superintendent of a mental hospital is now breeding schnautzers in the Antipodes; and

TABLE IV.A.—*Showing Present* (1934–35) *Distribution of the* 230 *Qualified Women*

	No. and per cent.
1. In general practice, at home or abroad	87 (37·8)
2. Specialists (consultant, academic, or research)	32 (13·9)
3. Full-time hospital posts (resident)	11 (4·8)
4. Full-time public service and public health posts	12 (5·2)
5. Government service abroad (including W.M.S. of India)	5 (2·2)
6. Mission service, at home or abroad	8 (3·5)
7. Medical officer to commercial firm	1 (0·4)
8. Dentists	2 (0·9)
9. Light work (welfare clinics or other part-time work)	14 (6·1)
10. Not undertaking professional work at present	37 (16·1)
11. Occupation unknown	11 (4·8)
12. Dead	10 (4·3)
	230 (100·0

[3] For explanation of the categories "light work" and "not undertaking professional work at present" see below.

of married women who propose to resume work when their children are older. That this may be no mere aspiration can be deduced from the fact that one who entered in 1917 and married in 1918 (4 children) resumed her studies after 10 years, qualified in 1933, and is now engaged on productive honorary research work.

1. *General practitioners.*—Unfortunately no inquiry was made whether a practitioner had acquired her practice by purchase or by putting up a plate, or was working as principal, partner, or assistant. Though several gave this information spontaneously, there are too many who did not particularise to make possible valid deductions from the replies. At least 12 are known to be in partnership with their husbands, 2 with their fathers, and 1 with a brother. From the comments in response to Question (*f*) it is clear that some firms of three or four women partners have been established; the acquisition of a new partner seems mostly to have been followed by a corresponding increase in the gross earnings.

Practitioners with hospital appointments.—Group 2 in Table IV.A was confined to those who, as far as could be ascertained, do no general practice. Many of those grouped as general practitioners in Group 1 who are attached to the honorary staff of their local hospitals in the capacity of physician, surgeon, psychiatrist, anæsthetist, and so forth, have acquired in varying degree a consultant status in the district. For example, one practitioner (F.R.C.S.Eng.) is attached to a general hospital as a surgeon; one spends half her time as assistant pathologist to a women's hospital; one holds the appointment of radium officer to a large general hospital; one is on the staff of a hospital for mental and nervous disorders and her practice is becoming specialised in this direction.

TABLE IV.B.—*Distribution of General Practitioners*

G.P.'s in provinces.	G.P.'s in London.	G.P.'s abroad.	G.P.'s now in practice.
57 (65·5 %)	25 (28·7 %)	5 (5·8 %)	87* (100 %)

* Of these, 27 are on the staff of their local hospital, in an honorary capacity or with an honorarium.

Table IV.B shows the number of general practitioners working in London (25), the provinces (57), and abroad (5). Of the total number of general practitioners now working, 27 (nearly one-third) are on the staffs of hospitals.

2. *Specialists (consultant, academic, and research).*—Of the specialists enumerated in Table IV.C many are on the honorary staff of more than one hospital, some of the posts not having previously been filled by a woman—e.g., that of ophthalmic surgeon to a London teaching hospital and of surgeon to the premier British ophthalmic hospital. University posts held range from teacher (2), demonstrator (2), lecturer (2) to reader (1). These do not include a lectureship in physiology at a physical training college or one in hygiene at a provincial university (which latter is held by a general practitioner). Of the research workers one is on the permanent staff of the Medical Research Council and is the author of important monographs. At least two others in this group of specialists have published successful books and original contributions of permanent value have been made by several of the women to special and general medical journals, one of which has a St. Mary's woman as an assistant editor. Of the two general surgeons one has a special interest in orthopædics; the other has won distinction not only in professional but also in public life, being a prominent member of the L.C.C.

TABLE IV.C.—*Specialists (Consultant, Academic, or Research)*

Physician	1	Radiologist	1
Surgeon	2	Physiologist	2
Gynæcologist	1	Pathologist	4
Anæsthetist	5	Research worker	4
Physiotherapist	2	Medical journalist	2
Ophthalmologist	4		—
Psychotherapist	4		32

3. *Full-time hospital posts (resident).*—The list of specialists detailed in Table IV.C is perhaps improperly diminished by the exclusion of those who hold, or held at the time of the inquiry, responsible resident appointments. These 11 women include, for example, a resident physician at a large municipal hospital in the provinces; a resident medical officer at a mental hospital; and a resident medical officer at a private hospital for surgical tuberculosis.

4. *Full-time public service and public health posts.*—In this category of 12 women are grouped, besides assistant medical officers of health and school medical officers, two important civil servants—i.e., a medical inspector of factories under the Home Office (who has been allowed to keep her appointment after marriage) and a medical officer to Holloway Prison.

5–12. These categories in Table IV.A are self-explanatory. One of the five in Group 5 is the second St. Mary's woman to be appointed professor of medicine at the Lady Hardinge College, India.

Post-graduate Experience and Previous Appointments

The cross-section of the distribution of the qualified women in 1934–35 set out in Table IV. takes no account of posts held or work done before that date, or of the ways in which the experience was gained which enabled the present post or success in general practice to be obtained.

TABLE V.A.—*Resident Posts Previously Held (H.P., H.S., &c.)*

St. Mary's.	Elsewhere.	Not known to have held a resident post.	Total.
94 (40·9 %)	51 (22·2 %)	85 (36·9 %)	230 (100 %)

TABLE V.B.—*Resident Posts Held by G.P.'s*

Those who had held resident post.	Those who had not.	G.P.'s (past and present).
73 (66·4 %)	37 (33·6 %)	110 (100 %)

TABLE V.C.—*Total Number of Resident Posts Held*

St. Mary's.	Elsewhere.	Total.	Number of women who have held them.	Average number of posts held by each woman.
151	190	341	145	2·35

Resident posts.—In this connexion it is of interest to see (Table V.A) that of the 230 qualified women as many as 145 (63·1 per cent.) held one or

more resident posts before engaging in the branch of medicine that was later to absorb them. Of these 94 obtained posts at St. Mary's (and often elsewhere as well) and 51 obtained posts as residents only at other hospitals. Of the 110 women who have been engaged in general practice [4] 73 had previously held resident posts in hospitals (Table V.B). Few of the 145 women who held resident appointments were content to apply for one only; some held as many as five or six in succession, not counting of course in this category the more permanent senior resident posts in general mental or special hospitals now held by 11 women (see Table IV.A Group 3). The average number of resident posts held by each of the 145 women works out to 2·35 (Table V.C).

Other "learning" posts.—At least 6 of the women have held one of the post-graduate research studentships available in the various departments of the Pathological Institute at St. Mary's, 8 have held registrarships (one at St. Mary's) and of course a very large number have gained experience as clinical assistants. Many still work at hospitals in this capacity while engaged in practice. The general impression given by study of the replies to the questionnaire is that whatever branch of work has been adopted considerable trouble has been taken to ensure adequate equipment for the responsibilities it entails.

Comments Made on Women's Work in Medicine

Eighty-eight of the women responded to the question "Would you care to make any comments on women's work in medicine, including income prospects?" The most striking feature of the comments is the emphasis laid on the scope for women in general practice, and this did not come only from those who were themselves doing this work. Several note that prejudice against women practitioners is fast disappearing and remark upon the friendly and helpful attitude of male colleagues. General practice is held on all sides to offer an interesting if strenuous life; but there are warnings against its adoption by those who are not physically strong, or on whom continuous domestic demands are likely to be made. One says: "The great mistake that many women G.P.'s commit is to make medicine a secondary interest to running a husband and family, or running clinics and school inspections."

Town practice is regarded as more suited to women than country practice, and some comment on the success which is likely to attend a man and woman practising together. "In my one case," says a partner in such a practice, "the income is difficult to judge, as the N.H.I. and other club cheques are paid jointly, but my private receipts often equal or exceed my husband's."

The financial returns from general practice appear to be satisfactory on the whole. Several who bought small nuclei, or put up a plate, record substantial annual increases in income, and others who bought established practices have taken in partners as the work has developed after a preliminary drop. The general impression is that it takes about five years to establish a practice as a sound profit-making concern, and that during these years a good deal of unpaid work will have to be done; an income derived from other sources is therefore essential, or some capital to be used as income during this period.

[4] Of these 87 are still so engaged (see Table IV. A; the rest have either specialised, retired temporarily or permanently, or are dead.

Some women note that working-class patients go to women more readily than do well-to-do ones; others record a contrary experience. One or two of those in consulting practice appear to have prospered exceedingly, but for the most part consultants and specialists have said little about the financial aspect of their work. The tendency for increasing numbers of women to specialise in gynæcology was deplored by several observers, whose remarks must be taken to apply to women in general, since it is noteworthy that only one St. Mary's woman is a specialist in gynæcology in the sense that she does no general practice at all. It is a matter of comment that women practitioners tend to attract gynæcological and pædiatric cases, and that specialisation in these branches is often developed from and associated with a general practice. Some emphasise the need for more women in psychological medicine in view of their special suitability for this work. The public health services are recommended by several as affording good prospects; others note that though the L.C.C. and other municipal authorities offer openings in the lower grades of the service women still find it difficult to get promotion to the higher grades. Some express regret at the prejudice against married women in the public health services. In this connexion it is of interest that though only 10 St. Mary's women are at present working as full-time assistant medical officers of health or school medical officers 10 others have at one time held such posts, of whom 7 are now married.

In the Government services at home and abroad salary and conditions seem on the whole to give satisfaction, except where prejudice exists against married women.

Some who are working in Colonial or Dominion medical mission services stress the wide field of opportunity for those fitted for very hard work under conditions which may be difficult; in the mission services women are urgently needed, and those who plead for recruits to join in this work evidently find ample compensation for the slender financial rewards in the interest and variety of their activities.

A few extracts from the comments made are set out below:—

"Very old people seem to prefer women doctors."—"Much valuable voluntary work is available for a married medical woman. . . . By doing voluntary work for some time for a Home I have induced the organisation to create a post now filled by a salaried doctor."—"It may be that men who consult women doctors do so because they are used to being doctored by their mothers."—"Children appear to be less frightened of women school medical officers than they are of men."—"Life here suits me down to the ground. I have a nice little house complete with dog and cat, some extremely good friends, my people within 20 miles, a car, lovely country all round, and I get on well with most of my patients though of course one gets exasperated with some for not paying."—"I know nothing about conditions of medical practice in the British Isles. In the more advanced tribes among whom I am now working (in the Belgian Congo) the natives come just as readily to a woman as to a man! . . . Among the more backward tribes a medical woman has far greater difficulties in getting patients than a man owing to the contempt and disdain with which women are regarded by the men and to the fact that the women more or less accept this, getting their own back at times by foul language or by starving their husbands."—"Women dental surgeons still somewhat of a novelty but a good living is to be made in dentistry."—"Women sometimes postpone going to a man if an extensive examination is needed."—"There seems to be increased confidence in medical women as obstetricians. I find that having three young children has increased rather than lessened my practice."—"In my opinion

medicine offers the best career at present open to women, married or otherwise, whether from the point of view of status or that of rewards, material and moral. A daughter of mine is about to enter the profession."

The general impression gained from the comments is that most of those who contributed to them are assured that medicine provides ample opportunities, in one or other of its branches, for women. It would seem that work is being done under conditions which are, for the most part, individually satisfactory, and that no one seeking congenial work has failed to find it.

I would like to thank Mrs. M. Cotton, M.B., Mrs. H. Davenport, M.R.C.S., Dr. Dorothy Fenwick, and Mr. Vernon, assistant secretary of St. Mary's Hospital Medical School, for their great help in the task of collecting these figures, and Mr. E. Cheeseman, of the department of epidemiology and vital statistics of the London School of Hygiene and Tropical Medicine, for assistance in the statistical tabulation.

GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 26–29TH, 1936

A Question of Canvassing

The Case of Salvatore Donadelli, formerly registered as of Cavasso Nuovo, Udine, Italy, and now registered as of Hanbury-road, Pontypool, Mon, M.D., U.Padua, 1917, who had been summoned to appear before the Council on the following charge:—

(1) That you have behaved improperly and in a manner unbefitting a registered medical practitioner to the following patients of the practice of Thomas John McAllen, a registered medical practitioner by whom you were employed as an assistant: (*dates and names specified in five cases, witnesses A.–E.*).

(2) That after you had ceased to be employed as an assistant by the said Thomas John McAllen you canvassed for the purpose of obtaining patients in respect of a practice as a registered medical practitioner which you proposed to carry on, and in particular canvassed: (*dates and names specified in nine cases, witnesses E.–M.*); of whom all except one (*witness M.*), who was a patient of Joseph Ferguson Blaine, a registered medical practitioner, were patients of the said Thomas John McAllen.

(3) That for the purpose of obtaining for your own advantage moneys which you were not entitled to obtain while you were employed as an assistant by the said Thomas John McAllen, and/or of procuring patients of the practice of the said Thomas John McAllen to become patients of the practice as a registered medical practitioner which you proposed to carry on, you depreciated the professional skill, knowledge, and services of the said Thomas John McAllen, and in particular by doing so (*five occasions specified witnesses N., O., and some of the previous*); all of whom were patients of the said Thomas John McAllen.

(4) That for the purpose of obtaining moneys for your own advantage, and/or of inducing the patient to become a patient of the practice as a registered medical practitioner which you proposed to carry on, you depreciated the services given by Arthur Carveth Johnson, a registered medical practitioner acting under a scheme for the treatment of tuberculosis by a public authority, in advising Mrs. P. to enter an institution for such treatment, and endeavoured to persuade her to make payments to you for medicines to be supplied by you as an alternative form of treatment.

(5) That during the time you were employed as an assistant by the said Thomas John McAllen, you made false and malicious accusations of negligence against the said Thomas John McAllen to Mr. and Mrs. Q., patients of the said Thomas John McAllen, in respect of his treatment of the brother of the said Mr. Q., with a view to your own advantage and/or in order to prejudice the said patients against the said Thomas John McAllen.

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainant was Mr. Thomas John McAllen, M.B., B.S. 1907, R.U. Irel.

Dr. Donadelli attended, accompanied by Mr. Ifor Lloyd, counsel, instructed by Messrs. Davis, Lloyds and Wilson of Newport.

The complainant was represented by Mr. T. Carthew, K.C., and Mr. A. A. Pereira, counsel, instructed by Messrs. Bytheway and Son.

On the first day of the session the Council's solicitor read a letter from respondent's solicitors begging for an adjournment as Dr. Donadelli had only heard of the charge on April 29th when he was on holiday in Italy. He had returned on May 4th, and next day had written to the Medical Defence Union asking for assistance, but this had been refused as both parties were members. Only on May 13th had he learned that postponement would be opposed by complainant. He had not been idle but it had been impossible properly to prepare the case in the remaining time. Moreover, he had absolutely no English money. He was prepared to undertake not to practise in Pontypool before the hearing of the case. Mr. Carthew opposed the application, which was refused. On the third day it was urged again by Mr. Ifor Lloyd, counsel, and again refused. Opening the case on the fourth day, Mr. Carthew explained that complainant had had occasion to warn Dr. Donadelli, while he was assistant, never to see female patients alone.

WITNESSES FOR THE COMPLAINANT

WITNESS (Miss A.) testified that on or about May 30th last respondent had visited her mother. She had asked for advice and he had insisted she should undress and lie on the bed. He had pulled her knickers down, put his finger into her private parts, and asked if she felt pain or pleasure. He had mentioned that he was the same age as she was and had a wife who was away. She had reported the matter, and later respondent had called and asked her to deny her former statement; this she had refused to do.

Cross-examined by Mr. Lloyd, she said she lived with her parents. She could not say how long the doctor had been in the house. She might have mentioned pain in the lower abdomen as well as the sweating of which she had chiefly complained. There was no couch in the sitting-room. She had not undressed beyond loosening her corsets. She had not known he was going to examine her. He did not speak English very well and she had had some difficulty in understanding him. She had told respondent she did not accuse him of assaulting her, and had agreed to see complainant, whom she had told she did not want to make any complaint.

In reply to the President she said this occasion was the first time she had seen respondent.

WITNESS (Mrs. B.) said that her mother-in-law and herself had long been patients of complainant. Dr. Donadelli had attended them about a year ago as assistant. She was suffering from a hæmorrhage after operation and was never free from pain. Each time respondent had visited her mother-in-law he had suggested examining her and she at last consented. He had pulled the curtains and examined her in bed. He had asked if her husband gave her any sensation and said he would try and give her one. He had told her she ought not to have any more children and offered to tell her how to prevent

it. She had complained to complainant and respondent had called and reproached her, saying he only did what all foreign doctors did. About Christmas-time he had called again and said he was sorry for her as she was not being properly treated.

In cross-examination she said he had asked her how she was, while visiting her mother-in-law. She had had lower abdominal pain. The window of the bedroom opened on to the street but she did not think people could see in. She did not agree that her mother-in-law was in the doorway the whole time; she was in the kitchen armchair and the door was shut. Nor had her mother-in-law fetched soap and water; she was too old. The doctor had not used a torch or implement. She had resented his examination. She had been examined there before but not in that way. She had told him she had pain on intercourse when he asked, but had not volunteered it. She had not complained until July because she did not like to. Dr. Donadelli had attended her later, but she had sent for Dr. McAllen and had not been examined by Dr. Donadelli. She had gone to the surgery about Christmas and had consulted him about her heart. She had thought another doctor was hiding something from her about her heart and so had gone to respondent.

In reply to Mr. H. L. Eason she said she had complained to Dr. McAllen in July on her own initiative; no one had spoken to her about it.

Mr. Carthew proved the serious illness of Mrs. C. and Mr. Lloyd objected to the reading of her statutory declaration in her absence. The President ruled that it be not read.

WITNESS (Mrs. D.) said she could just write her name but could not read. She recalled sending for Dr. McAllen and being visited by Dr. Donadelli. Next visit she had said she felt no better and he had said he would examine her. She was on her bed and he put his finger in her private parts and moved it up and down and then asked if she wanted a man. She had pulled the clothes over her and had later told her husband. A couple of days later he had called again and she would not speak to him. In March, 1936, he had called to question her about complaining.

Cross-examined, she agreed that she had been in bed ill with internal pains in the lower abdomen when she had sent for the doctor. She was 61 years of age and had had a good deal of experience of doctors. The respondent had not had any flash lamp. He had used his fingers and that was the indecent behaviour she complained of; no other doctor had ever done such a thing to her. She had been very disgusted.

WITNESS (Mrs. E.) said respondent had wanted to examine her, but she had refused. He had often suggested that the doors should be locked and had said she was thin because she did not go with her husband. He had urged her to have special treatments. Later he had told her he had left Dr. McAllen and started on his own and had asked if she and her husband would give their panel cards to him.

In cross-examination she said she and her husband had been pretty friendly with Dr. Donadelli. Respondent had never assaulted her in any way. He had often been in and out of the house and had treated her for diabetes, and told her to weigh herself. He had suggested hospital, but she had refused to go at first and he had suggested injections at home and given her tablets, for which she had never paid. After March she had had to go to hospital.

Dr. E. W. Bone elicited the explanation that Mrs. E. was a club patient.

WITNESS (Mrs. F.) testified that respondent had attended her and her husband while he was assistant to Dr. McAllen. Later he had called and asked them to transfer to him as he was setting up for himself.

Cross-examined she agreed she had been very friendly with Dr. Donadelli and was not surprised that he had called to say good-bye. She knew he had been living in Dr. McAllen's house but she had not asked him where he was going to live or what he was going to do. Her husband had been present but had not inquired about a panel. She knew nothing about his practice.

WITNESS (Mrs. G.), examined by Mr. Pereira, said that respondent had called on her as assistant and offered her special treatments from Italy. He had supplied tablets for which she or Mrs. F. had paid; they had done no good. He had told her that Dr. McAllen was very skinny and would skin all his patients. Later, he had said he was setting up himself and would not skin his patients nor charge them so much. He had asked for the panel cards.

Cross-examined, she said she had had rheumatism for years and had had many bottles from Dr. McAllen; these had done her good. She was quite satisfied with the result, though she still had the rheumatism. She had not asked Dr. Donadelli for new medicine or said her present medicines had not done her good. He had told her about cachets from Italy and he had got them without her asking. Respondent knew she was not on the panel, but had asked her and Mrs. F. for panel cards.

Dr. Bone inquired about the panel cards of the family and she said that her husband was on Dr. McAllen's panel but her elder daughter was on another doctor's. When respondent had asked for their panel cards she had thought he meant Mr. G.'s and Mrs. N.'s.

WITNESS (Mrs. H.) testified that Dr. Donadelli had called and said he had left Dr. McAllen and was looking for patients and would call any time of the day or night and would attend regularly. He had said he would call again to see her husband.

In cross-examination she said respondent had attended her as Dr. McAllen's assistant. He had not called to say good-bye and she had not asked where he was living or what he was going to do. Dr. McAllen had called on her and asked her to make the statement. He had not discussed Dr. Donadelli except to ask if he had been there.

In reply to members of the Council, she said respondent "as good as" asked her to become his patient by telling her his plans and directing her to his surgery.

WITNESS (Mrs. J.) said respondent had told her he was finished with Dr. McAllen, was on his own, and was taking panel patients, and that he would call at any time and regularly.

Cross-examined, she said he had been attending her little boy as assistant; he had not called to say good-bye. She had not asked questions but he had volunteered statements. He had never come again. When she had visited the surgery in March Dr. McAllen has asked if Dr. Donadelli had invited her to become his patient.

WITNESS (Mr. K.) said respondent had attended his wife as assistant. On March 13th he had called and invited them to become his patients.

Cross-examined, he said his wife had had three visits from the doctor and on March 13th he had not exactly come to say good-bye. There had been no discussion whatever about panel cards.

In reply to Dr. Bone witness said he had been out of work for six years and had not required medical attention. He had been on Dr. Blaine's panel. His wife had been attended by Dr. McAllen as the parish doctor. Respondent did not know their circumstances.

WITNESS (Mr. L.) said his son had been attended by Dr. McAllen and his assistant. Dr. Donadelli had offered injections from Italy, saying that Italian medicine was much more advanced. He had asked money for it. He had said all the stuff in Dr. McAllen's surgery was not worth twopence. Witness had refused the treatment for fear Dr. McAllen would subsequently have nothing to do with them. Later, respondent had called and said he had finished with Dr. McAllen and could see patients at another address.

Cross-examined, he said he had asked Dr. McAllen, his panel doctor, to call and he had done so and advised hot water treatment and a lotion; and later some ointment. He had been quite satisfied with the treatment. The disease had begun in November and the child had had it five years before. He did not remember respondent saying the boy had acidosis and needed something beyond local applications. Witness was accustomed to getting his medicines from the surgery and respondent had said the injections would not be found in the surgery and Dr. McAllen would not agree with them because they were too expensive.

WITNESS (Mr. M.) testified that he lived with his mother and was a patient of Dr. Blaine but Dr. McAllen was his mother's and his brothers' doctor, and Dr. Donadelli had attended his mother as assistant. He had called at the shop and announced that he was taking panel and private patients on his own. Witness had said he did not think Dr. McAllen charged his mother anything. Respondent had said he was very cheap, and would charge 3*s*. 6*d*. a quarter for a husband, wife, and child.

WITNESS (Mrs. N.) said she had been present every time respondent had called on Mrs. G. and corroborated that witness. He had supplied medicine to her daughter and had been paid for that and also by Mrs. G. He had said Dr. McAllen had nothing in his surgery that would do her any good but that he could get medicine from Italy that would cure her. Mrs. G. had been in great pain but had been quite satisfied with Dr. McAllen's treatment. Her daughter had not exactly asked him for medicine for her child but had said the little girl was ill and he had offered to get medicine from Italy. Her daughter had said it did not matter what it cost if the child got well, and he had supplied six bottles for 9*s*.

WITNESS (Mr. O.) testified that Dr. McAllen had attended his family for over 17 years. Dr. Donadelli had called to see him, as he had sciatica, and had said the medicine was no good and was only crushed aspirin and had offered better medicine but said it would cost money. Witness had decided he could not afford the £1 asked.

Cross-examined, he said he had been away from work for ten weeks with sciatica. Dr. McAllen had sent him two bottles at the beginning of his illness. He had wanted to get back to work but had not told Dr. Donadelli he wanted another medicine to get him well faster. He had been in pain for about a week at that time. The doctor had told witness to put a £1 postal order in a plain envelope with a 1½*d*. stamp, in order to send it away somewhere.

In reply to Dr. Bone, he said his panel doctor was Dr. Blaine, and Dr. McAllen was his works doctor, whom he paid through the poundage system. He had seen Dr. McAllen at the surgery and got the medicine there.

COMPLAINANT EXAMINED

Dr. MCALLEN said he had a large panel and private practice and was parish doctor and doctor to the urban district authority. As a result of complaints, he had given Dr. Donadelli notice. Later he had heard many complaints of canvassing and improper behaviour. He had himself seen Dr. Donadelli's plate up at Blaenavon, about 5½ miles from the centre of Pontypool. When he had first received the complaints he had been asked by his other assistant to give Dr. Donadelli another chance because the continental outlook was so different and what would be regarded as improper conduct here would be disregarded in Italy. Witness had made him promise not to examine another female patient alone. This promise he had kept. He had had no right to receive cash; most of the practice money came from the works and the rest from six-monthly accounts.

Cross-examined, he said respondent had himself asked for six weeks' probation at the beginning of his engagement on April 25th, 1935. He spoke English very well for a man who had only been two years in the country. The first complaints had been made a few weeks after engagement, within the probationary period. He had not the faintest idea how many patients Dr. Donadelli saw in a day; it might be thirty in a morning. The practice was an extensive working-class one. He himself had never found any kind of examination embarrassing. His other assistant had lived on the continent as a student. He could not say if there was more stiffness and reticence in this country than abroad. Despite the complaints, he had kept respondent on as a result of the other assistant's explanations. He had not regarded the matter as merely gossip. There had been no more complaints until after respondent had left. He had given notice on Feb. 11th and dismissed Dr. Donadelli summarily on Feb. 24th because he had been getting money from patients. None of those who had appeared at the hearing had complained before this notice. Respondent had been given at that time the name of one patient from whom he was said to have demanded money. In the agreement, witness was to pay respondent £75 a year for the use of his car. When notice was given witness had told him not to use the car for the last month; but this had not been just to save paying the allowance. Mr. L. had told his story between 9.30 and 11.30 on Feb. 24th. About 12.15 witness had seen respondent and said he was not to use his own car for the afternoon visits but to be driven to the end of the town in witness's car and to walk back. He had not dismissed him because he had used his own car in defiance of orders. He had never heard of Dr. Donadelli's war wound. He was not aware that he had no right to stop the car allowance as it was part of the contract. He had heard Mr. L. testify that he had not complained till the 29th, but still maintained that he had dismissed Dr. Donadelli because of Mr. L.'s report on Monday the 24th. He had, he admitted, gone round asking about complaints of canvassing. He and Dr. Donadelli

had disagreed about the treatment of patients from time to time. He had never insisted that prescriptions must be limited to drugs in the surgery. He had never seen a plate of Dr. Donadelli's in Pontypool. He did not know that he had been assistant and had tried to buy a practice in Blaenavon.

In reply to the legal assessor he said he had stopped the car allowance because respondent had claimed to have visited three patients whom he had never seen; witness had therefore sent his own chauffeur with him.

In reply to Dr. Bone and other members, he explained the poundage system and that it included supply of medicines. His dispensary was adequately equipped. He did not say he ought to have received the money himself; his case was that no money ought to have been taken from those patients and that was the cause of the dismissal. He agreed that the examining doctor was the best judge of the need for vaginal examinations and that patients sometimes objected to quite proper examinations.

No evidence having been offered on the last two charges, they were dropped.

RESPONDENT EXAMINED

Dr. DONADELLI said he had never committed any impropriety with any patient. Miss A. had complained of sweating and pain in the lower abdomen and back, and had asked him to examine her. She had undressed and he had examined the heart, the abdomen, and then the vagina with an illuminated speculum. He considered the examination necessary. He had asked if she felt pain—not pleasure. He had never discussed his wife and family. She had made no protest at the time. Dr. McAllen had later told him to go and investigate a complaint she had made. She had said she would herself go to Dr. McAllen and explain that she made no accusation of assault. Mrs. B. had been suffering severe lower abdominal pain and hæmorrhage and had asked him to examine her, as she was getting no better. He had examined her on a couch, with the mother-in-law in the room. She had complained of dyspareunia and he had examined her with his fingers and a torch. He had advised her to avoid intercourse until she recovered and had advised disinfectant douches. She had asked whether it would be harmful for her to have children and he had advised against it. She had shown no resentment. Later on she had visited him privately, saying she did not trust the hospital or other assistant but trusted him. Mrs. D. had been in bed with pain in the abdomen and back when he saw her. He had examined her vagina with speculum and torch. He had seen both her and Mrs. B. many times after. He had not asked her if she wanted a man. He had advised douching. Mrs. E. he had only examined once, and that in the presence of a friend. He was friendly with the members of the household and had visited often; he had never suggested locking the doors. He had advised insulin; she had refused to go to hospital. He had given her two boxes of anticoman tablets; there were no such tablets in the surgery, and he got them free as samples from the manufacturers. Neither she nor anyone else had paid for the tablets. Mrs. E. had known quite well that he was not opening a surgery in Pontypool; her husband had recommended him to a vacant club practice a little way off. She had sent a friend of hers to witness, but he had refused to see her because she lived in Pontypool. When Dr. McAllen dismissed him he had found a bedroom to live in but had had no surgery there. It was not true that he had asked Mrs. F. for panel cards. It had never been his intention to stay in Pontypool and he had tried the area around. He had visited a number of patients to say good-bye in a friendly way and they had asked him his plans. At that time he had no practice at all. There was a practice in the market at Blaenavon and he was negotiating for its purchase, and meanwhile practising there. The people of Pontypool would never go to Blaenavon for a doctor. It would have been useless for panel patients to transfer in March as the month's notice would have had to be given at the end of February. For the boy with dermatitis he had suggested calcium injections, which he had known only in Italy. The father had asked if he could get them at the surgery; witness had replied that he could not, and they were expensive. He had seen Mr. L. on a Monday (24th), the day he was dismissed, and had not called next day. He had seen Mrs. N.'s granddaughter who was having medicine from Cardiff. He had recommended a medicine he had used in Italy and she had asked him to send for it and asked the price. He had sent for it from Italy and had made no profit. It was not available in Pontypool. Mrs. G. had tried various medicines from the surgery without benefit and she had asked him to find something else for her. He had got cachets for her from Italy; they contained benzoate of soda, coramine, and other substances. To Mr. O. he had first said that Dr. McAllen wanted him to use only medicines in the surgery and nothing else, but as these were doing no good he had mentioned certain injections which could be obtained from a Newcastle chemist. He had intended the patient to send the money direct, and had never meant to handle it himself at all, but the patient had decided against the treatment.

Cross-examined by Mr. Carthew, he admitted that he had called on over a hundred patients to say good-bye. He knew that the women paid Dr. McAllen through contracts. He had told Dr. McAllen that the medicines in the surgery were insufficient, but had not told him he was taking money from patients for medicines. He did not think it was a grossly improper thing to do. Dr. McAllen had wanted to get him deported. He had no receipts because his family had bought the drugs for him in Italy.

Witness answered questions by members of the Council about his visits to patients and said he had lived in Pontypool from Feb. 25th to April 2nd or 3rd.

COUNCIL'S DECISION

After brief deliberation in camera the President announced that the Council would confine its attention to charges 2 and 3. Mr. Lloyd addressed it on behalf of his client, and Mr. Carthew spoke briefly. After a short period of deliberation the President announced that eight of the nine items of charge 2, and four of the five items of charge 3, had been found proved, and the Registrar had been directed to erase Dr. Donadelli's name from the Register.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW.—A new wing, for paying patients, at this hospital was opened on May 28th by Sir John Stirling Maxwell. The accommodation in the new wing consists of two wards of 12 beds each, and six rooms with single beds. The single rooms are intended for serious cases, and no difference is to be made in the charge for a bed in the single rooms and a bed in the wards. Through the Outram Press Fund, every bed is fitted with wireless. The fees are graded from eight guineas in the first week to three guineas in the fourth and succeeding weeks.

MEDICINE AND THE LAW

Damages Against Surgeon

THE judgment of Mr. Justice Finlay in Dryden *v.* Stewart and the Surrey County Council (see THE LANCET, April 25th, p. 969) will satisfy neither the patient nor the surgeon. Mrs. Dryden alleged that plugging was negligently left in her body after an operation. She claimed damages both against Dr. John Stewart, who had performed the operation, and against the county council in whose hospital she was treated and by whose nurses she was attended. The judge thinks that she exaggerated her story but did not go so far as to invent it; he has held that the plugging was inserted at the time of the operation and he can see no other explanation than that the surgeon inserted it and afterwards forgot that it was there. The judge awards £250 damages against Dr. Stewart; but, as he dismisses Mrs. Dryden's claim against the county council with costs, she may have to pay much more than she will receive. The judgment is of great importance to hospital committees as it may deter similar claims in future. First, however, we must deal with the case against the surgeon.

Mrs. Dryden was married in March, 1934. In the following August she became pregnant and in November had an accident which caused a miscarriage. The placenta remained in, and her regular medical attendant, Dr. Keble, advised her to go into the county council's hospital at Epsom. Here the placenta was removed by Dr. Stewart; the operation was followed by a douching, and Mrs. Dryden went home after about a week in hospital. Dr. Keble saw her on her return: she then complained of soreness, bruising, pain, and a discharge. Two days later, as she found it impossible to douche herself, Dr. Keble examined her and extracted what the judge referred to as a "black evil-smelling sausage of surgical gauze," tightly packed and extremely foul. Dr. Keble's evidence was that the state of this compressed and offensive mass was consistent with its having been inserted in the body nine days before—i.e., at the date of the operation. Three days later Mrs. Dryden went into the Kingston Hospital: here further plugging was removed by one of the sisters. She left hospital, returned to it in December, and in January, 1935, went back to work and had been at work ever since but complained of pain. The plaintiff's case was that she contracted pyelitis and cystitis and that the pyelitis might recur. The judge dealt carefully with the medical practice of plugging as discussed in the medical evidence. It was clearly proper, he said, to plug in the case of excessive bleeding, either actual or apprehended. Some surgeons always plugged; others, especially the younger members of the profession, did not do so habitually. Dr. Stewart, said the judge, was perfectly definite that he did not plug in this case; there was certainly no reference to plugging in the chart or records; all persons present said they saw no plugging used. But it was clear that plugging had been taken out as described by Dr. Keble. If Dr. Stewart did not insert it, the patient herself must have done so. Mr. Justice Finlay, while not favourably impressed with some of Mrs. Dryden's evidence and while of opinion that she displayed an undoubted animus against the nurses in the Epsom Hospital, did not think she was putting forward a deliberately false case—"and that, and nothing but that, is what she was doing if she put this plugging in herself." He did not see what motive she would have had in plugging herself and, though he bore in mind the evidence of Mr. Hedley (to which he gave great weight) that women can and sometimes do plug themselves, the difficulties of holding that Mrs. Dryden did so seemed to be insuperable. "I feel constrained to find that the defendant doctor did put in this plugging and then by an unfortunate lapse of memory forgot it." It was reasonably established that the pyelitis and cystitis were due to the presence of the foreign body and that in any future pregnancy there would be more risk of them. Mrs. Dryden had made a good recovery and had substantially been well since her return to health. For her pain and suffering, and for the possibility of future trouble, £250 was, in the judge's view, a proper sum to award.

In the case against the Surrey County Council there were questions of law as well as of fact. The judge reviewed the well-known decisions (including Hillyer *v.* St. Bartholomew's Hospital) and adopted the language lately used by Horridge, J., in Strangeways-Lesmere *v.* Clayton. The committee of a hospital contracts with a patient that they will provide a hospital, that is, an appropriate building suitable for the purpose, with a domestic staff which they will control; they also contract that they will employ or engage competent doctors and competent nurses, but they do not undertake to be responsible for the way in which the doctors or nurses perform their duties. Those duties, Mr. Justice Horridge had said, are the duties of skilled people; the actions of doctors and nurses cannot be controlled by members of a hospital committee who do not pretend the knowledge or ability to perform those duties themselves. Even if the nurses at Epsom had been proved guilty of negligence, it would (said Mr. Justice Finlay) be negligence in carrying out their skilled duty as nurses and it would not be negligence for which the county council could be responsible. Mrs. Dryden had alleged that the hospital staff was incompetent and the ward understaffed. The judge rejected these statements. There were 54 beds in the ward with one staff sister, one staff nurse, and five well-advanced probationers; the mere presence of probationers was no evidence of negligence. Patients might not receive in a ward the same individual attention as a rich person may pay for in his own home. The judge accepted the evidence of one of the sisters that the nurses, though busy, were not overworked. Although Mrs. Dryden said she complained of a black, foul-smelling discharge on her first return from the hospital, Dr. Keble had not detected it till he extracted the gauze. The nurses could not be held negligent for not having discovered what the hospital doctors did not observe and Dr. Keble did not at first detect. Plaintiff's counsel conceded that there was nothing to fix the nurses with knowledge that the plugging was in; they could therefore have had no duty to remove it.

One other point may be mentioned. There was an argument over the appropriate order against Mrs. Dryden for the costs of the county council. The latter body had the advantage of the Public Authorities' Protection Act, which apparently would mean that she would have to pay its costs as between solicitor and client, a much heavier liability than the ordinary scale of taxed costs. Mrs. Dryden's counsel asked the judge to deprive the county council of costs because it had refused, in the earlier stages of the litigation, to allow her lawyers to interview the nurses at its hospital. This refusal, it was argued, was

bound to inflame suspicions and to encourage the plaintiff in pursuing her rights. Mr. Justice Finlay thought that, if the county council had made a mistake in refusing to allow the nurses to be interviewed, it was not such a mistake as would justify him in depriving the county council of costs or in loading these costs on to Dr. Stewart. The claim against the county council failed on the law as well as on the facts; the allegations of negligence against the defendant doctor were different from those against the defendant county council, so that it was not fair to saddle Dr. Stewart with the whole bill. A stay of execution against Dr. Stewart was granted on the usual terms that he gave notice of appeal within 14 days and brought the money into court. There may thus be further judicial discussion of the case against the surgeon. On the case against a county council, as the body responsible for a hospital, more will be heard when the House of Lords at length completes the hearing in Marshall *v.* Lindsey County Council.

Dangerous Treatment of Rheumatoid Arthritis

At an inquest held last week by the Birmingham city coroner, death was apparently attributable to the too continuous use of gorun, prescribed as a remedy for rheumatoid arthritis. The deceased, a woman of 50, had suffered acutely for several years and was obliged to use crutches. A friend recommended treatment by Dr. H. Jacubson, a German doctor in Golders Green, who had made a successful cure. Dr. Jacubson saw the patient in the presence of her own medical attendant and, after examining her, recommended the drug. Her medical attendant obtained it from his usual chemists; after a properly cautious inquiry from them and from consultants, he was assured that it was harmless. He injected the drug twice a week until he found the patient's skin turning yellow. He was unaware that the preparation contained atophan; had he known this he would have realised that the treatment should be intermittent and not continuous. Post-mortem examination indicated acute yellow atrophy and necrosis of the liver. Among the witnesses who gave evidence before the coroner, Prof. P. C. P. Cloake of Birmingham University described gorun as a mixture of three drugs, one of them being atophan. It was a valuable remedy but must be given intermittently. The later literature issued with the drug contained a note as to the method of administration: the witness thought the warning inadequate. Dr. Jacubson, who was questioned through an interpreter, told the coroner that he was responsible for the formula of gorun which he had used for many years in Germany and had introduced into England in 1928. It contained 1 per cent. of atophan. Asked by the coroner why the warning note had not appeared in the literature issued to the deceased's medical attendant on the purchase of the drug, Dr. Jacubson said the note was added after a fatality in England a few years ago. He thought he had told the deceased's doctor that the doses should be intermittent. Another witness stated that medical practitioners might have difficulty in recognising atophan under the name phenyl-quinolin-carboxylic acid which appeared in the formula on the box. The coroner recorded a verdict of death by misadventure. He observed that the drug had been administered in good faith after consultation with the author of the formula and with the supplying chemists. The coroner had no hesitation in saying that in future the distributors ought to supply much more explicit instructions, especially if the treatment was likely to be prolonged in chronic cases.

On one point of general procedure there was a difference of opinion between the coroner and Prof. Cloake. The latter had held a post-mortem examination at the hospital and propounded the view that an inquest was unnecessary. The coroner asked him whether he knew of any substitute for an inquest which would be likely to obtain the same amount of publicity for facts which ought to be known. The medical attendant of the deceased had been unaware that he was administering a drug which contained atophan. Prof. Cloake answered that the proper nomenclature and disclosure of the ingredients of a preparation were a legal question; the law had apparently been complied with. The coroner did not go so far as to charge the professor with obstructing the inquest or tampering with the evidence. He was, however, clear that this was a "coroner's case" and not one for a private post-mortem examination without facilities for the attendance of relatives. Prof. Cloake continued to dispute the point and denied the right of the coroner to express such opinions to a witness. Without taking sides in this controversy on procedure, we can all unite in advocating full notice of any dangerous property in drugs which, however beneficent, are unfamiliar. If treatment is dangerous unless intermittent, the instructions should say so.

Conviction of Murder by Weed-killer

Charlotte Bryant was convicted at Dorchester assizes last week on the charge of having murdered her husband by administering arsenic to him. The deceased, a cowman, died in Sherborne Hospital on Dec. 22nd last. The Crown asked the jury to believe that he had at least two other illnesses and that all three were due to arsenical poisoning. The evidence of Dr. Roche Lynch established the cause of death. He found the organs of the deceased in a pinkish and inflamed state, and they were remarkably well preserved six days after death. He discovered arsenic in every organ he examined: he estimated that the body contained 4·09 grains of arsenic. The presence of arsenic in the finger-nails, to the amount of 33 parts per million, supported the view that the illnesses of August and December were attacks of acute arsenical poisoning. The witness could not speak as to arsenical poisoning in relation to the illness of the previous May. Mr. Justice MacKinnon told the jury that it was almost impossible that Bryant could have administered the arsenic to himself. No sane human being, having endured the agony of one attack, would subject himself to another. The poisoning might be accidental but the accident would have had to happen a second and third time. If the arsenic was neither self-administered nor accidentally swallowed, it must have been given him by somebody else: Mrs. Bryant was the only person (except for her children) who was living in the house during each of her husband's three illnesses in May, August, and December of last year. A possible motive was her intimacy with a witness named Parsons to whom she was said to have spoken of the prospect of her widowhood and remarriage. A tin of weed-killer was suggested as the source of the poisoning. Nobody could give evidence of Mrs. Bryant having bought arsenic or weed-killer, but a battered tin was found which a tin-box manufacturer stated was similar to the tins made by his firm for a weed-killer company. Dr. Roche Lynch analysed scrapings from this tin and found 58,000 parts of arsenic per million. He also examined sifted ashes

from under the copper; in these he found 149 parts of arsenic per million though coal ashes normally contained no higher proportion than 50 parts.

The defence was able to emphasise the absence of direct evidence. Both in May and August a doctor was called in by Mrs. Bryant to attend her husband in his attacks of illness. The doctor, "the very man of whom a murderess would have the greatest fear," was again summoned when the third illness occurred last December. This fact, and the failure to prove the purchase of weed-killer by Mrs. Bryant, were strong arguments in favour of her innocence. The jury, consisting of men only, found her guilty after deliberating for an hour.

PANEL AND CONTRACT PRACTICE

An Unrecognised Surgery

A PRACTITIONER who had a surgery for insurance and private patients, the existence of which he had not divulged to the insurance committee, has received a reminder that such things are not done. He has been on the medical list since 1913 and until 1926 he had two addresses at which treatment for insured persons was provided. During that year he applied for the committee's consent to the employment of an assistant and, as is usual, the surgeries were inspected when their condition was "such as not to meet with approval." The practitioner said his landlord had failed to have the branch surgery renovated, and he was not prepared himself to spend money on it; so with the approval of the committee the branch surgery was deleted from the medical list. From 1926 until last March the committee had no knowledge that the branch surgery was being used, but on the latter date, as a result of information received, a visit was paid to this surgery when it was found that the practitioner's assistant was conducting insurance practice there. The medical service subcommittee were satisfied on investigation that insurance medical practice was resumed at the branch surgery within a short time after its discontinuance had been notified; in fact, the practitioner did not seek to establish that it had ever been discontinued. The practitioner admitted he was ashamed of the condition of the surgery. He had, he said, done his best to discourage insurance practice at the surgery, and for a time had exhibited a notice requesting patients to attend at his principal surgery, but circumstances had been too strong for him; there was a certain amount of private practice at the branch surgery, with which he had been associated for 30 years, and he had retained the premises for sentimental as well as for business reasons. The subcommittee reported that the question they had to consider was not so much the propriety of the practitioner having a surgery in such an unclean condition—described elsewhere as squalid—as his having carried on practice at a surgery which he had notified the committee had been relinquished. The conditions under which this practice had been carried on were in their opinion such as to bring the insurance medical service into disrepute. The insurance committee has suggested to the Minister a fine of £50. It would have been much cheaper to put the surgery in decent condition.

Trouble Over a Strangulated Hernia

The sister of a deceased insured person complained of the way her brother had been treated by Dr. A and his assistant Dr. B. The patient had suffered for some years from the effects of hemiplegia and had frequently attended at Dr. A's branch surgery in order to obtain treatment which usually consisted in the provision of liquid paraffin. On March 17th he was not as well as usual, complaining of weakness in the legs, and constipation, and was seen by Dr. B. On March 21st Dr. B was again sent for and found similar symptoms, slightly more marked, but no cause for alarm. A hernia from which the man had suffered for some years was examined and found to be easily reducible. On the following evening the patient was not so well and at about 9 P.M. attempts were made to secure the attendance of Dr. A or Dr. B, but neither was available immediately. Eventually Dr. C was called in at about 10.15 P.M., but he could find no symptoms but weakness and flatulence, and noted the hernia which was still reducible. He did not take a serious view of the case and gave merely a placebo. About half an hour later Dr. A called and formed the opinion that the trouble might be of a cerebral character—particularly having regard to the previous history and to the fact that he found the patient's pupils did not react to light. He too examined the hernia, which he found large, but reducible, and having learned of the treatment prescribed by Dr. C he contented himself by suggesting hot fomentations if there should be any pain in the hernia, and said he would arrange for Dr. B, who had been treating the patient, to call next morning. Dr. B was called from his morning surgery to see the patient next day about 10 o'clock and found him suffering from a badly strangulated hernia and said the only chance, which he described as one in a thousand, of saving the patient was an immediate operation in hospital. He accordingly issued a request for admission to a local hospital but on arrival there about noon it was found impossible to operate and death ensued about an hour and a half later. The sister's contention was that the patient should either have been sent earlier to hospital or else, in view of the fact that death was apparently inevitable, that he should not have been sent at all.

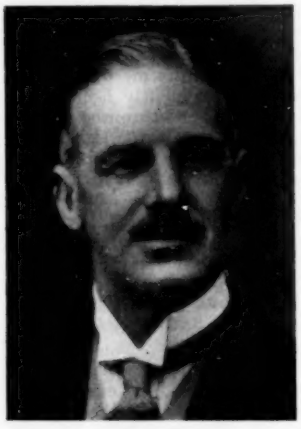
The medical service subcommittee pointed out that between the morning of Saturday and the evening of Sunday three different medical practitioners examined the patient and could find nothing suggesting the possibility of the development of the trouble which actually caused his death. They thought Dr. B was right in advising removal to hospital on the Monday morning. He knew it was extremely unlikely that anything could prevent an early and fatal termination of the illness, and had he refrained from sending the patient to hospital he might quite well have been accused of having failed to avail himself of the only possible chance, however remote, of prolonging the insured person's life. But it is doubtful whether the sister will be really satisfied with this perfectly proper decision.

LONDON HOSPITAL.—At the quarterly court of governors of this hospital on June 3rd, Sir William Goschen, the chairman, said that the progress of the £80,000 appeal was disappointing. So far only £17,679 has been received and promised. It had also proved impossible to proceed with the scheme for the provision of pay-beds for those of moderate means as the response to the appeal for this object had amounted to £16,000, including the late Lord Woolavington's gift of £10,000. A further £5000 is needed before a start can be made.

OBITUARY

HAMILTON CLELLAND MARR, C.B., M.D., F.R.F.P.S. Glasg.

THE sudden death of Dr. Hamilton Marr came as a shock to his many friends. He appeared to be in his usual health and was tending some flowers in his garden in Edinburgh when he was seized with a heart attack and died within a few minutes. Dr. Marr retired only last October from the office of senior medical commissioner of the General Board of Control for Scotland, and had hoped that rest from his official duties would allow him to devote his time to scientific and literary writing.



DR. MARR

[Photograph by Bacon & Sons

Born in Govan in 1870, the son of Hamilton Marr of Mauchline, Ayrshire, he was educated at Glasgow High School and at Glasgow University, where he graduated in medicine at the age of 22. From the outset of his medical career he was attracted to the study of mental and nervous disorders, and after spending a few years as assistant physician in the Crichton Royal Institution, Dumfries, and the Glasgow District Asylum, Woodilee, Lenzie, he was appointed superintendent of the latter institution in 1901. He became lecturer in psychological medicine in St. Mungo's Medical College, Glasgow, and extramural lecturer in mental diseases in the University, and his lectures attracted many students, not a few of whom fell under his influence and afterwards looked upon him as guide, counsellor, and friend. He was appointed H.M. medical commissioner in lunacy for Scotland in 1910, and subsequently senior medical commissioner for the General Board of Control. Both as medical superintendent and as commissioner his work was characterised by ceaseless energy and scientific enthusiasm which brought him the respect of his students and the esteem of his colleagues. During the late war he served as specialist in mental diseases to the troops in Malta and later as consultant in nervous and mental diseases to the Scottish Command; he held honorary rank in the R.A.M.C. as lieutenant-colonel.

In 1927–28 Dr. Marr was president of the Royal Medico-Psychological Association and gave an address entitled Dante and Rabelais, an Account of Two Medieval Physicians, with a summary of their philosophy. Two years ago, when he delivered the James Watson lectures before the Royal Faculty of Physicians and Surgeons of Glasgow, he took as his subject Madness in Literature and Life. His publications included "Psychoses of the War" and many articles on insanity and mental deficiency. "Throughout his whole career," writes a medical friend, "he was a keen searcher after truth. He travelled extensively abroad and was a student of French and Italian literature. In long striving to improve the conditions of asylum administration in Scotland he did not always see eye to eye with his colleagues, but he was definite in his opinions and his work was characterised by sincerity."

Dr. Marr was created C.B. in 1932. He is survived by his wife, who is a daughter of the late Mr. John Mitchell, rector of Elgin Academy, and by a son and daughter.

DR. JOHN HOWARD WRIGHT, whose death from typhoid on May 30th at Tientsin was announced in our last issue, went out to China for the London Missionary Society in November, 1922. He was educated at King Edward's School, Birmingham, and Edinburgh University, taking his medical degree in 1921. He was stationed first at Siaochang and at Tsangchow where he was in charge of the Roberts Memorial Hospital. On his transference to Tientsin he did fine work in developing and increasing the equipment of the Mackenzie Memorial Hospital there, which now has a staff of 3 Chinese doctors and 39 nurses, and last year treated 1725 in-patients and 27,875 out-patients. Dr. Wright married Miss Margaret Burnett Aitken, of Edinburgh, and leaves his widow with two children. He was in in his 40th year.

DR. ALBERT ERNEST COPE, who died in London on June 5th at the age of 68, was well known as public vaccinator for the City of Westminster and hon. secretary of the Association of Public Vaccinators. Born at Chesterfield, the son of Rev. Thomas J. Cope, he was educated at Mansfield and Hull, qualifying in medicine at Newcastle in 1889. After holding a resident appointment at the Royal Infirmary he came south to be R.M.O. at the Westminster Dispensary and remained in practice in the borough throughout his life.

DR. ERNEST WOODHEAD BLACKBURN was the younger of two medical sons of Dr. John Blackburn, sometime mayor of Barnsley, who have maintained the tradition of general practice in that town for 75 years. He took a first class in natural science at Oxford before his clinical study at St. Bartholomew's Hospital, from which he qualified in 1895. Before returning north he was resident at the Radcliffe Infirmary, Oxford, and demonstrator of pharmacology in the University museum. In the following year, when the borough police force was established in Barnsley, Dr. Blackburn was appointed surgeon to it and he only resigned the appointment a few weeks ago. For many years he was also surgeon to the Beckett Hospital. He died on May 25th at the age of 68.

AN ADDITIONAL TELEPHONE SERVICE.—At a dinner of the Head Postmasters' Association held at Cardiff on May 29th Major Tryon, the Postmaster-General, said he proposed shortly to introduce a new service as an experiment in Liverpool. The subscriber would be able to inform the telephone exchange that he would be absent for a certain period and ask that callers should be given a brief message such as the reason for his absence and the time of his return. The telephone exchange would also keep a note of the telephone numbers of those who called the subscriber and to whom his message was given. The charge for the new service would be 6*d*. for each occasion up to 24 hours, and there would also be a contract rate. The proposed medical telephone exchange at Johannesburg described in THE LANCET of May 23rd (p. 1217) shows how this idea may be specially adapted for the medical profession, but the more general scheme to be tested in Liverpool should also prove of value.

CORRESPONDENCE

THE STORAGE OF BLOOD FOR TRANSFUSION

To the Editor of THE LANCET

SIR,—Your leading article last week marks the initiation of interest in the employment of cadaveric blood in western medicine; as you say, research in this subject is overdue. On the other hand preserved blood from "universal" donors was employed by a number of surgeons during the war, myself among them. From the latter part of 1917 onward, performance of blood transfusion prior to amputation of a limb was a routine measure, which reduced the mortality-rate for amputation of the thigh by over 14 per cent. in the base hospital of which I had surgical charge. It will be realised that the reservoir of donors was of variable capacity; for this reason, following the experience of Captain Robertson, of the Massachusetts General Base Hospital, American Army, a supply of citrated preserved blood was kept at hand continually; actually the stock was not allowed to fall below six Winchester quarts. As no cold-storage facilities were available, 10 minims of chloroform were added to the Winchester as preservative, and the blood decanted for use; the sterility was controlled by weekly examinations. To the best of my recollection our experience tallied with that of Robertson, that the preserved blood was valid for use up to 28 days; no incompatibilities, or reactions more severe than those met with in recently citrated blood, were encountered.

Specimens of blood which had been preserved for two months were sent, I think, to Prof. L. E. Bayliss for examination: he wrote that these appeared to have developed an excess of a toxin of the histamine group, but that some histamine was present in all citrated blood. For this reason, whole blood, uncitrated, and given via the paraffin-coated tube, was normally employed. I had records of over 400 cases thus transfused; and have often felt that the credit of the introduction and spread of transfusion in the British Army was not given where it belonged—viz., to Mr. D. W. Crile, nephew of his famous uncle, who popularised it in the base hospitals in the Étaples area as early as 1915.

I am, Sir, yours faithfully,

Sunderland, June 4th. W. GRANT WAUGH.

DISEASES OF THE PERIPHERAL ARTERIES

To the Editor of THE LANCET

SIR,—The recent review (May 2nd, p. 1012) of my book, "The Diagnosis and Treatment of Diseases of the Peripheral Arteries," prompts me to offer the opinion that the reviewer has evidently been guilty of one or more amputations in thrombo-angiitis obliterans, which I so heartily condemn. My efforts to establish the conservative therapy of this disease in America have apparently not been felt in England as yet. However, having already successfully overcome these stages of opposition in America, I feel sure that it will be only a matter of time when a conservative attitude toward these diseases will be forthcoming in our English colleagues.

I am, Sir, yours faithfully,

New York, May 29th. SAUL S. SAMUELS.

*** Our review questioned how far conservatism can be carried in the patient's interests. The point at which severe suffering is best ended—even at the cost of a mutilating operation—must be left to individual judgment based on a knowledge of end-results. We hope Dr. Samuels will provide further information about the subsequent efficiency of the limbs he has saved from amputation.—ED. L.

PUBLIC HEALTH

The Cost of Syphilis in an Urban Community

IN times of economic depression communities as well as individuals have to look to their bank balances and consider whether and where expenditure can be reduced, and whether the money they spend can be put to more effective use. The public health services are no exception to the rule, though it may be a difficult, if not impossible, task to measure their value to the community in terms of pounds, shillings, and pence, especially with regard to particular items: what does ill-health cost the community? how much of it is preventable and at what expense? One item in this account has been recently made the basis of a study[1] carried out in Baltimore by Drs. W. C. Thompson, W. A. Brumfield, and Lucile Caldwell of the syphilis division of the medical clinic, Johns Hopkins Hospital. The authors' object was to obtain an accurate estimate of the cost of syphilis in a representative American community, and to see whether the amount spent is adequate to deal with the existing problem, and so allocated as to provide "the combination of maximum benefit for the infected patient and maximum protection for the public health."

The investigation was carried out by an analysis of the clinical records of hospitalised patients and by means of cost data of hospital treatment, ambulatory clinics, serologic laboratories, and cost of drugs in the year 1933. Patients privately treated were ignored. In Baltimore, with a population of about 828,000, they report that some 9000 new syphilitic patients are discovered yearly, of whom about 4000 have early syphilis and 5000 have late syphilis. The total *direct* cost of that burden in 1933 they assess roughly at $170,000, or, in other words, each new syphilitic patient is responsible for the charitable expenditure of more than $18 per year. A study of the age-distribution of the hospital patients showed that nearly three-quarters of them were under the age of 50; as 74 per cent. of the hospital costs were for cardiovascular and neurosyphilis, which usually lead to prolonged invalidism, the authors conclude with reason that most of these patients, in the prime of life, are permanently removed from the possibility of self-support and form an annual charge.

On the other hand the sum available for ambulatory clinics they regard as quite inadequate and for many patients they find no treatment at all is available. They urge that if that sum were substantially increased much of the cost of hospital care would be obviated, since the late sequelæ of the disease would be prevented and fresh infections reduced. They thus reach the undeniable conclusion that "only by a reduction in the incidence of syphilis can the total expenditure be reduced," and the reasonable though, perhaps, less certain corollary that "only by the

[1] Amer. Jour. Syph., May, 1936, p. 243.

provision of adequate ambulatory clinics can the incidence of syphilis be reduced." In general, they believe that health departments give to the venereal diseases far less attention than they deserve, both from the patient's and the community's point of view.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 30TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1795; diphtheria, 879; enteric fever, 46; pneumonia (primary or influenzal), 806; puerperal fever, 42; puerperal pyrexia, 106; cerebro-spinal fever, 22; poliomyelitis, 7; encephalitis lethargica, 12; dysentery, 26; ophthalmia neonatorum, 104. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 5th was 5031, which included: Scarlet fever, 1061; diphtheria, 756; measles, 1944; whooping-cough, 566; puerperal fever, 16 mothers (plus 11 babies); encephalitis lethargica, 284; poliomyelitis, 1. At St. Margaret's Hospital there were 27 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In 122 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 47 (18) from measles, 5 (0) from scarlet fever, 32 (6) from whooping-cough, 32 (5) from diphtheria, 40 (11) from diarrhœa and enteritis under two years, and 31 (8) from influenza. The figures in parentheses are those for London itself.

Southampton, Hull, and Birmingham each reported 3 deaths from measles, no other great town more than 2. Birmingham had 4 fatal cases of whooping-cough, Liverpool 3. Deaths from diphtheria were reported from 19 great towns, 4 from Sheffield, 3 from Bradford.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 40 per 1000 total births), including 51 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lts. C. Ommaney-Davis and A. Long to be Surg. Lt.-Comdrs.

S. J. Atkinson, H. Bradley-Watson, and E. C. Jenet to be Surg. Lts. (D).

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Capt. J. B. Ronaldson, V.D., K.H.P., to *Pembroke* for R.N.B.

Surg. Lt.-Comdr. A. H. Shelswell to *Drake* for R.N.B.

Surg. Lt. F. W. Baskerville to *Vimy*.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. C. Scaife retires on ret. pay.

Maj. S. J. A. H. Walshe, D.S.O., to be Lt.-Col.

Temp. Capt. N. W. Walmsley relinquishes his commn. and retains the rank of Capt. (Substituted for notification in the *Gazette* of Dec. 11th, 1918.)

Short Serv. Commissions: Lt. R. Phillipson to be Capt., and J. A. MacDougall, J. C. A. Marchand, and K. H. Foster to be Lts. (on prob.).

REGULAR ARMY RESERVE OF OFFICERS

Lt.-Col. J. E. M. Boyd, M.C., and Maj. D. de C. O'Grady, D.S.O., having attained the age limit of liability to recall, cease to belong to the Res. of Off.

ARMY DENTAL CORPS

Capts. to be Majs.: C. E. Day and W. McAndrew.

Short Service Commissions: Lts. (on prob.) confirmed in their rank: C. W. Upton, J. H. Sherwen, B. E. ffrench, W. F. O'Carroll, R. J. Godfrey, R. Edwards, and A. F. Town.

TERRITORIAL ARMY

Capt. D. H. Clarke having attained the age limit relinquishes his commn, and retains his rank.

General List: Capt. M. L. Sutcliffe to be Maj.; B. B. Hosford (late Cadet, Highgate Sch. Contgt., Jun. Div., O.T.C.) to be Lt.; and Lt. J. W. E. Webster to be Capt.

ROYAL AIR FORCE

Flying Offrs. R. C. O'Grady and E. W. R. Fairley to Medical Training Depôt, Halton, on appointment to short service commissions.

Dental Branch.—Flying Offr. S. Hill to Home Aircraft Depôt, Henlow.

AUXILIARY AIR FORCE

T. McM. Boyle is granted a commission as Flying Officer, No. 609 (West Riding) (Bomber) Squadron.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: G. A. Khan, H. H. Elliot, M.B.E., M.C., and D. Clyde.

The undermentioned officers have vacated appts. in India:—

A.D.M.S.: Col. N. Low, D.S.O., O.B.E., *V.H.S.*, Brit. Serv.

D.A.D.P.: Maj. F. G. A. Smyth, R.A.M.C.

D.A.D.H.: Maj. D. G. Cheyne, O.B.E., M.C., R.A.M.C.

The undermentioned appts. have been made in India:—

D.A.D.P.: Lt.-Col. J. B. A. Wigmore, R.A.M.C.

D.A.D.H.: Capt. K. F. Alford, I.M.S.

The undermentioned officers have assumed new appointments in India: Col. W. E. R. Williams, I.M.S., O.B.E., as Assistant Director of Medical Services, Lucknow District; Lt.-Col. H. G. Winter, M.C., R.A.M.C., to Rawalpindi District staff; and Lt.-Col. R. B. Price, D.S.O., R.A.M.C., to Southern Command Headquarters.

Lt. (on prob.) W. J. Young is secd. while holding an appt. at St. Bartholomew's Hospital, London.

Capt. J. N. Vasudeva relinquishes his temp. commn.

The grant of the rank of Capt. to Capt. Antonelli Saldanha is cancelled.

Indian Medical Department.—Lts. (Sen. Asst. Surgs.) to be Capts. (Sen. Asst. Surgs.): H. A. Young, G. R. Aitkins, A. W. Hazle, F. B. A. Braganza, C. Lobo, E. J. Creais, and J. W. Traynor.

Asst. Surgs. (1st Cl.) to be Lts. (Sen. Asst. Surgs.): R. L. Dunn, W. A. Beer, E. A. Eates, G. U. Oakley, J. J. F. Dunn, A. J. Raphael, C. W. E. Frederick, and C. W. E. Peters.

Majs. (Sen. Asst. Surgs.) L. A. Francis and G. V. Aitkins to retire.

COLONIAL MEDICAL SERVICE

Dr. D. M. Blomfield and Dr. B. P. Harris have been appointed Medical Officers, Kenya.

H. A. Gilkes, M.C., M.D. (Medical Officer, Northern Rhodesia), becomes Deputy Director of Medical Services, Trinidad.

NEW END HOSPITAL, HAMPSTEAD.—The hospitals and medical services committee have submitted to the London County Council four schemes for the improvement of the Council's hospitals. One of the schemes is the erection of a new nurses' home at New End Hospital and the adaptation of an existing building for staff accommodation at a total cost of some £43,500.

ROYAL EAST SUSSEX HOSPITAL.—Improvement of the hospital services of the country as part of a memorial to King George was stressed at the annual meeting of the governors of this hospital at Hastings on June 3rd. This institution has been greatly extended in recent years, and when the new theatres and consulting-rooms have been finished, 17 private wards are to be provided for which an appeal will be made. The ninety-seventh annual report gave the number of in-patients during the year as 1805, and the number of out-patients, including casualties, as 12,288, with a total of 74,989 attendances. Road casualties accounted for 96 cases. These involved a cost to the hospital of £889 but only £269 was received in return. There was an excess of expenditure over income of £3860.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EMBOLISM IN THE LIMBS

Sir Thomas Lewis, F.R.S., delivered the George Alexander Gibson lectures of the Royal College of Physicians of Edinburgh last Monday and Tuesday. His title was Symptoms and Signs of Embolism in the Limbs with Special Reference to Pain. He began by describing the changes which develop in a limb after complete occlusion of the blood-supply with a tourniquet. The limb immediately becomes slightly pale; then a stage of cyanosis develops; and this in turn is followed by reappearance of pallor, which increases. The temperature of the limb falls slowly. If the muscles of the limb are kept at rest there is little or no pain; but if they are exercised, severe pain develops in those that are being used. This pain is due to an accumulation of products of metabolism and disappears in two or three seconds if the circulation is re-established. The blood which restores the circulation must be oxygenated if it is to bring relief. When the limb is kept at rest after occlusion of the blood-supply the first disturbance noticed is that there is some loss of the sense of touch at the finger-tips. This analgesia slowly spreads up the limb from the periphery, at the rate of about 5 cm. per minute. True anæsthesia to light touch develops in the same way, and with it position-sense becomes lost. Muscular power disappears also at this stage. In the upper extremity the small muscles of the hand are first affected; the extensors of the wrist then become weak, and finally the flexors lose power. The ability to appreciate pain and temperature is lost at a later stage. Examination of limbs that have been amputated shows that the pilomotor response is preserved even longer. Sir Thomas Lewis has been able to prove that the effect on the nerves is caused neither by an effect on the end-organs, nor by pressure on the nerve, but by loss of the blood-supply to the nerve. The longest nerves to the ends of the extremities are the most vulnerable, as they also appear to be in cases of peripheral neuritis.

In his second lecture Sir Thomas discussed the cause of the pain which occurs in clinical cases of embolism of the main arteries of the limbs. He explained that the theory commonly accepted was that the pain arises at the moment the vessel is blocked and is due to some local effect on the wall of the artery. This explanation, he believes, cannot be accepted. Numbness and paralysis of the affected limb are often present, it is observed, by the time pain appears, and the site at which the pain is felt is often distal to the position of the embolus. Obstruction of the abdominal aorta, for example, first causes coldness and numbness in the legs and later paralysis and pain felt in the legs, not in the abdomen. Re-establishment of the circulation by operative removal of an embolus at once relieves pain in the limb just as it was relieved, in the experiments, by removal of the tourniquet. The lecturer referred to a case in which an embolus was dislodged from the axillary artery and settled at the lower end of the brachial artery. This event gave complete relief from pain in the arm, though the radial pulse did not return. The blockage of a blood-vessel in the brain or lungs causes no pain, but if a vessel is blocked in a muscular organ, such as the heart or gut, pain is a striking feature of the disturbance produced. Sir Thomas Lewis concluded, therefore, that the pain caused by embolism of a large artery to a limb develops at an interval after the blockage, and is always associated with ischæmia of the tissues of the limb. The tissue primarily concerned in the production of this pain is, in all probability, the muscles.

A NEW DERMATOLOGICAL DEPARTMENT

On June 5th Sir Norman Walker opened the new dermatological and venereal diseases department of the Edinburgh Royal Infirmary. The building, which has cost £40,000, has five floors and a basement. The venereal diseases department occupies the lower three floors, while the third and fourth floor form the skin department. Included in the building is provision for 38 in-patients in the venereal diseases section and 46 in-patients in the skin diseases section. Sir Norman Walker said that John Hughes Bennett, who became professor of physiology in 1848, was the first to teach dermatology in Edinburgh. Beds were first set aside for skin disease in the Infirmary in 1891 and the opening of the new eye department in 1905 enabled cases of skin diseases to be admitted to Ward 2. He considered that the new department was the best in the country. Besides the 46 beds available, there are also 90 for diseases of the skin at the Western General Hospital.

PARIS

(FROM OUR OWN CORRESPONDENT)

OUTBREAKS OF PINK DISEASE

A RECENT communication by Dr. Rocaz of Bordeaux to the French Academy of Medicine seems to indicate that infantile acrodynia has lately been quite common in the South West of France. Since he reported his first case in 1926 he has observed 68 similar cases himself, and has been informed of 90 others observed by colleagues about whose diagnoses there could be no doubt. If to these 158 cases be added other known cases that Dr. Rocaz has been unable to check and the doubtless numerous cases escaping recognition, the total must run into several hundreds. The geographical distribution suggests that there are several more or less dense centres of this disease, in each of which some 20 to 30 cases have been observed. Other minor centres have been responsible for some 10 cases each. The distribution of the disease would seem to correspond to that of other diseases conveyed by carriers; and in two of the main centres, infantile acrodynia seemed to follow the course of important waterways. Most of the children were aged 1–3 years, and there were few cases above the age of 6. The sexes were equally involved, and the distribution of the cases throughout the different seasons of the year was most irregular. It may perhaps be significant that the centres in which this disease was most common were also those which have suffered much from other neurotropic diseases such as encephalitis and poliomyelitis. The occurrence of more than one case in the same family suggested infection; in one family, a brother and a sister developed typical infantile acrodynia at the same time. In another family one child developed and recovered from acrodynia that overtook another child 20 months later, born in the interval. In a third family, a child developed the disease 3 months after having been in contact with a cousin who was suffering from it.

In the presence of similar events recorded by other observers, Dr. Rocaz is of the opinion that this cannot be explained away as a mere coincidence.

PARAMEDICAL ASPECTS OF HANDWRITING

Dr. Camille Streletski has just published a book entitled "Précis de Graphologie Pratique" (Paris, 1936). Its 381 pages contain some 500 specimens of handwriting whose most characteristic features and "true inwardness," as Ibsen used to call it, are commented on by the author in an objective and critical spirit. The investigations of Charles Richet and others have done much to rehabilitate graphology as a science, rather than a game with which to amuse cynics in a court of law. Dr. Stretleski's contribution to the subject is as serious as it can be, and in addition to many original observations, his book contains much evidence of a careful study of the work of his predecessors. Considerable space is devoted to grapho-pathology, a subject in which neurologists and psychiatrists may be expected to be particularly interested. One of the most arresting chapters is entitled "Le film graphologique." Here the author traces the modifications imposed on the handwriting of one and the same person by internal and external changes as he grows older; and one of the most notable subjects chosen for this very, very slow motion film is Dr. Alexandre Guéniot, specimens of whose handwriting from the age of 25 to that of 100 are reproduced. In the course of this work, the author traces the influence of disease and other factors, internal and external, on the handwriting.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Reassembly after Whitsuntide

THE House of Commons reassembled on Tuesday, June 9th, after the Whitsuntide recess.

Importation of Scientific Apparatus

On June 9th, in the House of Commons, the Finance Bill was considered in Committee. On Clause 5 (which continues Part I. of the Safeguarding of Industries Act, 1921, for a further period of ten years from August 19th, 1936) Mr. THURTLE moved an amendment to the subsection which provides for the importation of certain scientific apparatus free of duty provided that the Board of Trade are satisfied that such goods are not likely to be made in this country within a reasonable time, or in sufficient quantities. The amendment provided that the Board of Trade must also be satisfied that such goods are not likely to be available in this country "at a reasonable price."—Mr. G. GRIFFITHS, who seconded the amendment, said that hardship was caused to diabetic patients by the 33⅓ per cent. duty on hypodermic needles.—Dr. BURGIN, Parliamentary Secretary to the Board of Trade, in reply, said that the section did not apply to hypodermic needles, but was to enable high-priced scientific instruments to be brought into the country free of duty. In the case of such instruments, which would probably be ordered singly, he questioned whether it was possible to define "a reasonable price."—Sir FRANCIS ACLAND said that until a few months ago a first-rate British hypodermic needle made of rustless steel could not be obtained, and if the needle were not rustless the expense of obtaining fresh needles was considerable. There were now two sorts of British needle. We had beaten the foreign needle on merits, and he could not believe that the British manufacturers, having succeeded in making first-class goods, would wish to rely on a high duty.—The amendment was negatived by 192 votes to 131.

HOUSE OF COMMONS

TUESDAY, JUNE 9TH

Destruction of Human Food

Mr. MATHERS asked the Secretary of State for Scotland whether he would give particulars of any instances brought to his notice during the last 12 months of food of any description fit for human consumption having been destroyed; whether he would state the reasons in each case for the destruction; whether action was taken under his authority before or since the food was destroyed; and whether it was his intention to seek any further powers he might have found necessary to prevent such waste.—Sir GODFREY COLLINS replied: According to the information possessed by the Scottish Departments concerned the position in Scotland for the year ended May 31st, 1936, is as follows: Approximately 1200 tons of herrings and 50 tons of other fish were destroyed at ports in Scotland. These amounts represent less than ½ per cent. of the total landings in Scotland—namely, 275,000 tons. The principal reasons were that supply was in excess of market demand and that the fish was of poor quality. There was also a small quantity of milk which could not be utilised economically on non-school days. I am not aware of any other instances. I have no authority to take any action in the matter.

Mr. WILSON asked the President of the Board of Trade if he would state the cases brought to his notice in which during the last 12 months food of any description fit for human consumption had been destroyed, and in each case the reason for the destruction; the action taken by the department, either before the destruction or since; and whether it was intended to take further powers to prevent such destruction.—Mr. RUNCIMAN replied: No such cases have been brought to my notice beyond those mentioned by my right hon. friend the Secretary of State for Scotland in the answer he has given to-day, to which I cannot usefully add.

Reduction of Working Hours

Mr. TOM SMITH asked the Minister of Labour if he had any further information to give the House regarding his discussions with employers of labour on the question of a reduction of working hours.—Lieut.-Colonel MUIRHEAD replied: No further meetings have taken place since those referred to in the reply given on May 21st. As a result, however, of my right hon. friend's meeting with representatives of the distributive trade the organisations agreed to appoint representatives with whom the department could consult for the further examination of the position with regard to wages, hours, and working conditions in those trades, and communications have been received from other organisations who wish to be associated with these discussions. As pointed out in the previous reply, the principal effect of the discussions has been to cause closer attention to be given to the question relating to absorption of more workpeople into employment, but my right hon. friend proposes to have a report prepared on the discussions for the information of those interested.

Experiments on a Dog

Sir ROBERT GOWER asked the Minister of Agriculture what was the nature of the research work begun in the United States of America and continued in this country on a dog permitted to be quarantined at the Royal Maternity and Women's Hospital, Glasgow, during the past year; by whom such research work was conducted; the time of its duration; and whether any pain or suffering was caused to the dog.—Sir JOHN SIMON, Home Secretary, replied that no experiment had been made on the dog since its arrival in the United Kingdom. As Sir Robert Gower was aware, he had no jurisdiction in regard to experiments performed outside the United Kingdom.

MEDICAL NEWS

University of Oxford

On June 6th the degree of D.M. was conferred on J. N. O'Reilly. At a convocation on June 24th it will be proposed to confer the honorary degree of D.Sc. on Dr. E. D. Adrian, F.R.S., fellow of Trinity College, Cambridge, and Foulerton professor of the Royal Society.

University of London

A university readership in physics is to be established which will be tenable at the Royal Cancer Hospital. The regulations for the academic post-graduate diploma in dietetics have been approved and copies may be had from the academic registrar.

Lord Dawson has been reappointed to the senate as representative of the faculty of medicine, and Prof. T. B. Johnston has been appointed representative of the general medical schools.

Mr. R. Davies-Colley and Mr. C. Jennings Marshall have been appointed as examiners in surgery for this year, and Prof. E. D. Telford and Mr. G. T. Mullally as examiners for the M.S. examination in July to fill the vacancies caused by the resignation of Mr. E. K. Martin and Mr. P. H. Mitchiner.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

J. C. B. Bone, Middlesex (*a*, *b*, *c*, university medal); E. P. Clarke (*d*), St. Bart.'s; C. J. Cobbe (*a*), St. Thomas's; A. L. Craddock (*a*), London; R. S. Ellis-Brown (*d*), Guy's; Joyce M. George (*c*), King's Coll.; Sholem Glaser (*b*), London; C. A. Lillicrap (*a*), Guy's; Mary H. Robbins (*d*) and Eileen D. M. Wilson (*c*), Roy. Free.

(*a*) distinguished in medicine. (*b*) distinguished in pathology. (*d*) distinguished in surgery. (*c*) distinguished in obstetrics and gynæcology.

Ruth M. Addison, Roy. Free; Charles Anderson, St. Bart.'s; G. A. Armstrong, Westminster; H. R. Arthur, St. Thomas's; R. A. J. Asher, London; Mary Barber, Roy. Free; H. H. F. Barns, Univ. Coll.; H. L. W. Beach, St. Bart.'s; B. E. Blair, St. Thomas's; Kathleen E. Burnell, Roy. Free; Henry Caplin, London; H. B. C. Carter-Locke, St. Thomas's; Annys M. Cusack, Univ. Coll.; Thomas Denness, St. Thomas's; E. W. Dunkley, London; A. G. Edwards and G. J. Evans, Guy's; H. D. Fairman, London; J. E. Giesen, Guy's; R. M. Glass, Westminster; Philip Glazer, King's Coll.; Margaret M. Hanford, Roy. Free; H. R. S. Harley, Guy's; Jack Hartsilver, St. Bart.'s; C. E. W. Hoar, Westminster; C. D. Holdstock, London; K. F. Hulbert and A. C. Jones, Middlesex; W. W. Jones, Guy's; A. C. Kanaar, St. Bart.'s; G. H. W. Keates, Guy's; L. M. Kelly, St. Thomas's; H. M. Kelsey, Guy's; F. B. Kiernander, St. Thomas's; F. J. D. Knights, Middlesex; J. H. Lawrence, Univ. Coll.; W. D. F. Lytle, St. Thomas's; J. McA. McArthur, Guy's; J. R. M. Martin, St. Bart.'s; Elizabeth M. Morgan, Roy Free; E. G. Murphy, Univ. Coll.; Lucy M. B. Nelson, Roy. Free; R. J. Niven, St. Thomas's; K. L. G. Nobbs, St. Mary's; H. A. Oatley, Univ. Coll.; J. D. Ogilvie and W. A. Oliver, St. Bart.'s; John Pemberton, Univ. Coll.; Marjorie L. Penwill, Dorothy J. Perkins, Lena F. G. Priestman, and Grace E. Reed, Roy. Free; J. C. Roberts, St. Bart.'s; Irene H. Rogers, King's Coll.; Eric Sayle, Guy's; Mary Scott, Roy. Free; D. J. Sheehan, St. Bart.'s; W. E. Springford, Charing Cross; W. J. Stokes, London; C. H. Tanner, Univ. Coll., Cardiff; R. N. Tattersall, Univ. of Leeds; Frank Taylor, Guy's; G. R. Taylor, St. Bart.'s; H. C. Thomas, London; R. C. Tudway and Winifred J. Wadge, Univ. Coll.; Alan Wardale and H. F. West, King's Coll.; and Donald Wilson and C. A. Young, St. Mary's.

University of Wales

At recent examinations the following candidates were successful in obtaining the tuberculous diseases diploma:—

S. N. Ahmed, Pranatharthihara Arunachalam, S. M. Basu, L. R. Dongrey, E. F. Drum, John Duffy, J. K. Feeney, M. A. Hai, D. V. G. Muthu, B. R. Patel, A. K. Shariff, and M. P. Sinha.

University of Dublin

Dr. O'Donel Thornley Dodwell Browne has been elected to the King's professorship of midwifery in the School of Physic, Trinity College, Dublin, to fill the vacancy left by the resignation of Dr. T. Henry Wilson. Dr. Browne is a medical graduate of the University of Dublin and a fellow of the Royal College of Physicians of Ireland.

Cambridge Graduates' Medical Club

The annual dinner of this club will be held at King's College, Cambridge, on Friday, June 26th, at 7.30 P.M. Mr. W. H. C. Romanis, vice-president, will take the chair, and the hon. secretaries may be addressed at 1, Park-square West, London, W. 1.

Prof. Charles Singer will deliver the eleventh Fison lecture in the medical school of Guy's Hospital on Thursday, June 18th, at 5 p.m. He will speak on Magic and Medicine in Early England.

British Social Hygiene Council

Sir Kingsley Wood, the Minister of Health, is to address the annual meeting of the British Social Hygiene Council in the London School of Hygiene and Tropical Medicine, Keppel-street, at 2.45 P.M. on Wednesday, June 17th. **All interested are invited.**

Elizabeth Garrett Anderson Hospital

The centenary of the birth of the founder of this hospital formed the occasion of a special visit by its first president, the Duchess of Kent, following a luncheon in the board room to which Sir Alan Anderson and Dr. Louisa Garrett Anderson were invited. Brief speeches were made by Lady Robertson, chairman of the hospital, and Lady Barrett, M.D., who said that 6000 women doctors were now practising in this country. She drew attention to the value of the work being done by medical women and to the wide range of their activities.

Nurseries for the Children of the Unemployed

Lord Eustace Percy, M.P., formerly president of the Board of Education, opened the extension of the Save the Children Fund's emergency open-air nursery for children of the unemployed at North Shields on June 10th. The extension makes accommodation available for 80 children, aged two to five, instead of 40 as at present. Plans for an additional nursery for another 80 children at the east end of the town and for a nursery at Hebburn-on-Tyne have been passed by the Board. Progress is also reported in regard to other efforts of the fund in providing these nurseries for the children of the unemployed. In South Wales, the possibility of extending the nursery at Merthyr Tydfil is under consideration; and at Hoxton application has been made to the London County Council for recognition of the nursery as it is the only one of the kind in the neighbourhood. Of the 10 emergency open-air nurseries established by the fund during the past ten years, 9 have been recognised by the Board of Education for grant, and their chief medical officer, in his last annual report, gave special commendation to the fund's work in this realm.

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O., at rate of £110.

Ashton-under-Lyne.—Res. Surg. O. and H.S., at rate of £200 and £150 respectively.

Battersea General Hospital, Battersea Park, S.W.—H.S. and H.P., at rate of £130 and £120 respectively.

Bedford County Hospital.—First H.S., at rate of £155.

Belfast, Royal Maternity Hospital.—Res. H.S., at rate of £100.

Belgrave Hospital for Children, Clapham-road, S.W.—Second H.P., at rate of £100.

Birmingham City Education Committee.—Asst. School M.O., £500.

Birmingham City, P.H. Dept.—Two Res. Asst. M.O.'s, each £400.

Birmingham Selly Oak Hospital.—Res. Surgeon, £700. Pathologist, £750. Also Radiologist, £800.

Blackburn Royal Infirmary.—Res. H.P., £175.

Bolton Infirmary.—H.S., £125.

Bootle General Hospital.—H.S. or Cas. O., at rate of £150.

Bradford, Royal Eye and Ear Hospital.—H.S., £160.

Brecon County.—Asst. M.O., £500.

Brighton, New Sussex Hospital for Women, Windlesham-road.—H.S., £100.

Brighton, Royal Sussex County Hospital.—Cas. H.S., £120.

Bristol General Hospital.—Two H.P.'s, three H.S.'s, Res. Obstet. O., H.S. to Spec. Depts., at rate of £80. Also Cas. H.S., at rate of £100.

Burton-on-Trent General Infirmary.—H.S., £150.

Cardiff, Llandough Hospital.—Sen. Res. Surg. O., £450.

Chesterfield and North Derbyshire Royal Hospital.—H.S. to Ear, Nose, and Throat Depts., at rate of £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Radiologist.

Colchester, Essex County Hospital.—Asst. H.S., £120.

Connaught Hospital, Walthamstow, E.—H.S., at rate of £100.

Croydon County Borough.—Asst. M.O.H. and Asst. School M.O., £500.

Derby, Derbyshire Royal Infirmary.—Gynæcological H.S. and Emergency Anæsthetist, £150.

Derbyshire Education Committee.—Asst. School M.O., £600.

Doncaster Royal Infirmary.—H.P., at rate of £175.

Dorset County Council.—Clin. Tuber. O., £750.

Dover, Royal Victoria Hospital.—Res. M.O., £180.
Dreadnought Hospital, Greenwich.—H.P., at rate of £110.
Ealing, King Edward Memorial Hospital.—Sen. Asst. Res. M.O., at rate of £200.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Hon. Asst. Phys.
Great Yarmouth General Hospital.—H.S., at rate of £140.
Halifax Royal Infirmary.—Third H.S., at rate of £150.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.S., at rate of £100.
Hastings, Royal East Sussex Hospital.—Jun. H.S. and Temp. H.S., at rate of £150 and £200 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. M.O., £175. Also Res. Aural Reg., £150.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.P., at rate of £100.
Huddersfield, St. Luke's Hospital.—Res. M.O., £200.
Hull and Sculcoates Dispensary.—Res. M.O., £500.
Ilford, King George Hospital.—Hon. Asst. Dermatologist. Cas. O. and Surg. Reg., Res. Med. Reg., each £150. Also two H.S.'s, each £100.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. to the Asst. Surgeons and H.S. to Senior Surgeon, each £144.
Isleworth, West Middlesex County Hospital.—Asst. M.O., £400.
Kent County Council.—Asst. for Tuber. Administration, £900. Also Asst. for Hospital Administration, £800.
Kettering and District General Hospital.—Second Res. M.O., at rate of £125.
Kidderminster and District General Hospital.—H.S., £150.
Leeds University.—Lecturer in Biochemistry and Lecturer in Physiology, each £500.
Lingfield Epileptic Colony.—Asst. M.O., £300.
Liverpool, Alder Hey Children's Hospital.—Res. Asst. M.O., £200.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt., £250.
Liverpool Stanley Hospital.—H.S., at rate of £100.
Liverpool, Women's Hospital.—H.S., at rate of £100.
London County Council.—Asst. Physicist, £450.
London Hospital, E.—First Asst. and Reg. to Children's Dept., £300.
London Lock Hospital, Dean-street, W.—Surg. Reg., £100.
London University.—Examinerships.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S., at rate of £200.
Manchester, Ancoats Hospital.—Res. Surg. O., £200.
Manchester, Monsall Hospital for Infectious Diseases.—Jun. M.O., at rate of £250.
Manchester Royal Infirmary.—Cardiographic Registrar and Res. Clin. Pathologist, each £150.
Manor House Hospital, Golders Green, N.W.—Jun. M.O., £200.
Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Metropolitan Hospital, Kingsland-road, E.—M.O. for Jewish Out-patients, £100.
Middlesbrough, North Riding Infirmary.—Third H.S., at rate of £125.
Middlesex Colony for Mental Defectives, Harper-lane, Shenley.—Second Asst. M.O., £460.
Miller General Hospital, Greenwich, S.E.—H.S., at rate of £100.
National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Registrar, £200.
National Temperance Hospital, Hampstead-road, N.W.—Res. M.O., at rate of £175. Cas. O. and H.S., at rate of £120 and £100 respectively. Also Surg. Reg., 40 guineas.
Newcastle-upon-Tyne Royal Victoria Infirmary.—Res. H.P.'s and H.S.'s, each at rate of £50. Also two H.S.'s for Leazes Hospital, each at rate of £100. Also two Anæsthetists, each at rate of £200.
New Zealand, Wellington Hospital Board.—Asst. Supt., Medical, £1000.
Northampton General Hospital.—Secretary-Superintendent, £600.
North Riding of Yorkshire County Council.—Asst. School M.O., £500.
Nottingham City.—Asst. Tuber. O., £500.
Nottingham City Education Committee.—Jun. Asst. School M.O., £500.
Nottingham City Hospital.—Res. Surg. O., £350.
Nottingham Hospital for Women.—H.S., at rate of £150.
Oldham Royal Infirmary.—H.S., Cas. O., and H.P., each at rate of £175.
Plymouth City General Hospital.—Jun. Asst. M.O., £250.
Plymouth, Prince of Wales's Hospital, Greenbank-road.—Res. Anæsthetist and H.S., at rate of £120.
Portsmouth and Southern Counties Eye and Ear Hospital.—H.S., at rate of £120.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S., at rate of £120–£150.
Prison Service.—M.O., Class II., £525.
Public Dispensary, 122, Drury-lane, W.C.—Res. M.O., £150.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O., at rate of £200. Also H.S. and Cas. O., each at rate of £100.
Queen Mary's Hospital for the East End, Stratford, E.—Radiologist, £350. Also Cas. and Out-patient O., at rate of £150.
Reading, Royal Berkshire Hospital.—Three H.S.'s and Cas. O., each at rate of £125. Also Hon. Asst. Anæsthetist.
Rochester, St. Bartholomew's Hospital.—H.P. and Cas. and Orthopædic H.S., each at rate of £175.
Royal Army Dental Corps.—Dental Surgeons.
Royal Cancer Hospital, Fulham-road, S.W.—Sen. Asst. Radiologist, £350.
Royal Chest Hospital, City-road, E.C.—Hon. Physician.
Royal College of Surgeons of England.—Examiner in Anatomy.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Asst. Aural Surgeon.
St. Andrews University.—Chair of Midwifery and Gynæcology.
Scotland Department of Health.—Regional M.O., £800.
Sheffield, Jessop Hospital for Women.—H.S., at rate of £100.
Southampton, Royal South Hants and Southampton Hospital.—H.S. to Ear, Nose, and Throat Dept. and Res. Anæsthetist, at rate of £150.
Southend-on-Sea General Hospital.—Med. Reg. and R.M.O., £300.
Southern Rhodesia Medical Service.—Two Government M.O.'s, £600.
Stafford, Cheddleton Mental Hospital, near Leek.—Asst. M.O., £600.
Stafford, Prestwood Sanatorium.—Jun. Asst. M.O., at rate of £300.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S., at rate of £150.
Surrey County Council, Reigate Institution.—Med. Supt., £900. Also Res. Asst. M.O., at rate of £375.
University College Hospital, Gower-street, W.C.—Bilton Pollard Fellowship, £650. Also Hon. Asst. Radiologist to National Dental Hospital.
West Bromwich, Hallam Hospital.—H.P., at rate of £200.
West London Hospital, Hammersmith-road, W.—Pathologist, £750. Med. Reg. to Children's Dept., £100. Also two H.S.'s, H.P., Res. Cas. O., and Res. Anæsthetist, each at rate of £100.
West Malling, Kent, Leybourne Grange Colony for Mental Defectives.—Asst. Res. M.O., £350.
Westminster Hospital, Broad Sanctuary, S.W.—House Anæsthetist, at rate of £100. Also Hon. Anæsthetist.
West Sussex County Council.—M.O.H., £340. Also M.O.H. for Horsham Urban District, &c., £460.
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S., at rate of £150.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Clin. Asst. to Skin Dept. Also Res. Cas. O., at rate of £100.
Winchester, Royal Hampshire County Hospital.—Res. Surg. O. and H.P., at rate of £200 and £125 respectively.
Windsor, King Edward VII. Hospital.—Two H.S.'s, each £100.
Wolverhampton Education Committee.—Asst. M.O., £600.
Wolverhampton Royal Hospital.—Asst. Res. M.O., at rate of £100.
Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—H.S., at rate of £100.
Worcester Royal Infirmary.—H.S., £160.
Worksop Victoria Hospital.—Jun. Res., £120.
York County Hospital.—Res. Anæsthetist and Asst. H.S., £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Oldham West (Lancashire), Hemel Hempstead (Hertford), Whithorn (Wigtownshire), Kenilworth (Warwickshire), Dalbeattie (Kirkcudbrightshire), and Marple (Cheshire).

Births, Marriages, and Deaths

BIRTHS

CARDELL.—On June 3rd, at Weymouth-street, W., the wife of J. D. Magor Cardell, F.R.C.S. Eng., of a daughter.
JOHNSTON.—On May 31st, at Edinburgh, the wife of Dr. D. Scott Johnston, Gold Coast, West Africa, of a daughter.
JORY.—On June 3rd, at Highgate, the wife of Norman Jory, F.R.C.S. Eng., of a daughter.
MEYER.—On June 3rd, at Devonshire-place, the wife of Dr. Peter F. Meyer, of a son.
PURSER.—On May 31st, at Devonshire-place, W., the wife of Dr. J. A. Purser, of a son.
RANSOME WALLIS.—On May 31st, the wife of Dr. R. Ransome Wallis, of Marsden, of a daughter.
SCOTT.—On June 3rd, at Hook, Hampshire, the wife of Dr. Rupert H. Scott, of a son.

MARRIAGES

CAIGER-SMITH—GRANGER-EVANS.—On June 3rd, at St. Peter's, Belsize Park, Oliver Caiger-Smith, M.R.C.S. Eng., to Janet Maxwell Granger-Evans, second daughter of the late John W. Evans, F.R.S., and of Dr. Granger-Evans.
KNOWLES—TREEBY.—On June 3rd, Thomas Knowles, M.D. Edin., late of Christchurch, Hampshire, to Janet, widow of Alfred Treeby, J.P., of Whitehayes, Christchurch.
MAXWELL—EVANS.—On June 4th, at St. Bartholomew the Great, Smithfield, James Maxwell M.D., F.R.C.P. Lond., to Elizabeth Nan Evans.

DEATHS

AIRD.—On June 7th, at Hove, Thomas Wilson Aird, M.D. Durh., M.R.C.S. Eng., late of Wallington, in his 86th year.
COPE.—On June 5th, Albert Ernest Cope, M.D. Durh., D.P.H., late of Westminster, aged 68.
LIVINGSTONE-LEARMONTH.—On May 30th, at Yenching University, Peiping, Agnes M. Livingstone-Learmonth, C.B.E., M.B. Edin., wife of Dr. Basil L. Livingstone-Learmonth.
MANNING.—On May 30th, at Swindon, Ernest John Manning, M.R.C.S. Eng.
MARTIN.—On June 5th, suddenly, at Cheltenham, John L. Martin, M.B. Edin., formerly of Chelmsford, aged 67.
MORRIS.—On June 2nd, at Cullompton, Devon, Lt.-Col. Charles Reade Monroe Morris, D.S.O., R.A.M.C.
POWELL.—On June 8th, at Wolfeholt, Iffley, Oxford, Colonel John Powell, M.B., B.Ch., B.A.O. Dub., D.S.O., late R.A.M.C.
ROBINSON.—On June 4th, at Cannington, Bridgwater, George Burton Robinson, M.B. Durh., L.R.C.P. Lond., aged 67.
ROBINSON.—On June 3rd, suddenly, at Colwyn Bay, Frederick William Robinson, M.D. Aberd., F.R.C.S. Eng., formerly of Huddersfield.
STEIN.—On May 31st, at Hampstead, N.W., Dr. Charles Guthrie Stein, M.B. Edin., aged 81.

**N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

NOTES, COMMENTS, AND ABSTRACTS

THE LAW OF ABORTION

Germany

THE German Eugenic Law of July 14th, 1933, which came into force on the first day of 1934, contained a clause (§ 14) prohibiting sterilisation except as carried out under this law (and of course, castration) unless performed by a doctor in accordance with the recognised principles of medical practice in order to avert serious danger to the life or health of the person concerned and with that person's consent. The revised Eugenic Law of June 26th, 1935, applied this prohibition explicitly also to the artificial termination of pregnancy. In order that any doubt about the exact interpretation of the clause might be set at rest the Ministers of the Interior and of Justice issued jointly three weeks later (July 18th) the so-called Fourth Injunction which amplifies and explains this section of the law for the benefit of the medical practitioner whose duty it will be to carry out its provisions. The injunction may be summarised as follows.

THE FOURTH INJUNCTION

Sterilisation or abortion for medical reasons, i.e., in the interest of the mother's health, must only be carried out if a specially constituted tribunal has pronounced it to be necessary. When urgency is great, abortion is allowed without previous consent, and consent is excused when in operating for disease of the sex organs sterilisation cannot be avoided.

The Minister of the Interior will set up medical courts for the purpose of considering applications for sterilisation or abortion on grounds of health. Each court is to be under the direction of a president appointed by the Minister, who will select the other members, as far as possible in rotation, from a panel of approved medical practitioners. A doctor is not permitted to refuse to serve, but may be excused on urgent grounds (e.g., of health) by the president; if dissatisfied with the latter's decision he has a right of appeal, in the last resort, to the Minister. Only practitioners of Aryan extraction are eligible for the panel. No fee is payable for service, but members are entitled to claim their expenses according to a scale laid down by the Minister. No doctor may adjudicate on a case referred by him to the court—a rule which may be waived at the discretion of the president if it is impossible otherwise to obtain a sufficient number of members. If the president of the court has proposed a case for decision, a deputy must preside in his stead when this case is dealt with.

Each case must be referred to the court by the patient's own doctor, who must be of approved status, i.e., authorised to practise in Germany. Application is in writing on a special form setting forth the grounds on which the petition is based. Petitions for sterilisation or abortion on social grounds will not be entertained, and are forbidden; petitions on eugenic grounds are not to be addressed to the court but directly to the proper medical authority. Both the application itself and the decision of the court must be based on the principles embodied in directions issued by the Minister of the Interior in conformity with the general consensus of medical opinion.

Before any operation for sterilisation or abortion is carried out, the consent of the woman must be obtained. If possible this should be done before the application is submitted to the court. If the woman's mental condition is such that she is incapable of giving consent, it may be given by her legal representative or guardian; or if she has none by a representative nominated for the purpose by the local authority. Consent may be excused only in extreme urgency.

The application is sent by post or brought by the patient to the court and received by the president, who appoints two members of the panel to deal with it. The names of the examiners are communicated to the patient who attends for examination by each independently at an appointed time. To obviate the possibility of collusion, neither examiner must communicate with his colleague or with the patient's own doctor until he has formed his opinion on the case and conveyed it to the president. Judgment is pronounced by the president on the results of these two independent examinations. If they agree he is bound to pronounce accordingly; if they differ he examines the case himself and gives the casting vote, or in case of difficulty he may call in a consultant to assist him. When the court has reached a decision it is communicated by the president to the patient's medical attendant, whose duty it is to inform the patient

The patient is required to pay a fee, in order to cover the running expenses of the scheme, according to a scale to be fixed by the Minister. Any surplus that may remain after all expenses have been paid will be devoted to medical charities, i.e., the relief of necessitous doctors or their dependants.

Sterilisation or abortion may only be carried out in an institution, public or private, the choice of which is left to the patient. Abortion may be carried out in the patient's home if removal to an institution is likely to endanger her life or seriously injure her health. In general the operation may not be performed by any of the medical men who have adjudicated upon the case, but exceptions to this rule may be made at the discretion of the president. The surgeon shall be chosen by the patient's doctor, and the fees of both shall be settled in the ordinary way by the patient.

The doctor or midwife in attendance (or failing these, any person, not a relation of the patient or member of her household, present at the time) is pledged to notify the public health authority within three days of all cases of spontaneous abortion and premature labour up to the 32nd week of pregnancy. In the case of induced abortions authorised by the special courts, the surgeon performing the operation must also notify the court within three days of the operation. Failure to notify abortion is punishable by a fine.

If abortion and sterilisation are both deemed necessary for medical reasons in the same case, the Minister's wish is that they should be carried out if possible at one and the same time in order to avoid multiplication of operations. Any patient requiring repeated Cæsarean section should, in general, be sterilised at the time of the second operation.

Any person who performs a sterilising operation or induces abortion without proper authorisation shall be punished by imprisonment.

A TREATISE ON MEDICAL INDICATIONS

One of the most important clauses of the injunction is that which makes the Minister of the Interior responsible for laying down the guiding principles upon which all applications for sterilisation and abortion, as well as the decisions of the medical tribunals, are to be based. The directions of the Minister are to correspond with the accepted principles of medical science, and he has entrusted the task of formulating the medical indications for sterilisation and abortion to the new official body, the *Reichsärztekammer*. The fruits of its labours have now been published in the form of an official handbook,[1] issued under the editorship of Dr. Hans Stadler. This publication, which contains the text of the Fourth Injunction, explanatory notes, and a series of articles covering the whole field of medical

[1] Richtlinien für Schwangerschaftsunterbrechung und Unfruchtbarmachung aus gesundheitlichen Gründen. Munich: J. F. Lehmann. 1936. Pp. 180. RM.3.75.

indications for sterilisation and abortion, is intended to ensure uniformity of practice. It does not deal with the legal aspects of the injunction, which are included in another authorised handbook.[2] Each of the medical sections is written by an expert, and the subjects dealt with, in order, are the toxæmias of pregnancy, cardiac diseases, pulmonary tuberculosis, other medical conditions (renal disease, blood diseases, &c.), gynæcological diseases, mental and nervous diseases, surgical conditions (malignant growths, &c.), diseases of the ear and throat, eye and skin. A section is devoted to the value of radiology in assisting the medical examiner to form an opinion as to the desirability or otherwise of interference. The articles are illustrated by numerous plates and diagrams, and together constitute a clear and useful summary of the present-day views regarding therapeutic abortion and sterilisation. The book is not intended to be final; it is pointed out that in respect of certain conditions (e.g., the toxæmias of pregnancy) opinion has not yet crystallised, and the results of further research and observations must be awaited before dogmatic statements can be made. The door is thus left open for such revision of the work as future advances in knowledge may render necessary.

No instructions are given in this manual as to the technique to be adopted in performing sterilisation or abortion, for this is done in the commentary. An appendix however is added concerning the use of radiation (X rays and radium) for producing sterility. This is expressly forbidden except where the woman is over 38 years of age, where the state of her health renders any operation dangerous, or where other pathological conditions exist for which radiotherapy is the appropriate treatment. These methods of sterilisation may only be carried out by practitioners and in institutions recognised for this purpose by the Minister, who will also determine the scale of fees to be charged. All cases so treated must be followed up and the results reported to the medical authority

The book is prefaced by a request to all practitioners to assist the authorities in keeping it up to date by reporting their own experiences in practice.

England

It is a little significant that the German views on therapeutic abortion should have become available just at the same time as the report[3] of the special committee set up by the council of the British Medical Association, at the request of the representative body, to consider the medical aspects of abortion. In this report the term abortion is defined as expulsion of the fœtus before the age of viability (28 weeks). Its frequency is difficult to ascertain, but in this country 16 to 20 per cent. of all pregnancies are believed to terminate in abortion, and there is evidence that in the majority of cases it is artificially induced. Abortion contributes largely to the general maternal mortality and morbidity, especially in criminal cases.

THE LAW FORBIDS ABORTION

The law unequivocally forbids the induction of abortion in any circumstances whatever; it contains no saving clause to justify a medical practitioner in performing therapeutic abortion. On the other hand, the interpretation of the law is less rigid. Lord Riddell, in addressing a joint meeting of the Medico-Legal Society and the section of obstetrics and gynæcology of the Royal Society of Medicine (Jan. 21st, 1917), stated that a practitioner "will not be liable to conviction if he honestly believes that what he does is required to save the mother's life or health." Apart from conviction, however, the present state of the law renders a doctor liable to indictment with its attendant publicity which may prove almost equally damaging to his professional reputation, and the committee concludes that the whole question needs to be examined with the object of clarifying the doctor's position in relation to the law, which should at least contain an explicit statement of the principles governing justifiable abortion. Further to safeguard the practitioner the committee would like careful consideration to be given to the proposal that abortion must only be carried out with the approval of two independent medical men; in its opinion the acceptance of this proposal would be one of the greatest boons that could be conferred on the medical profession.

INDICATIONS, MEDICAL AND ECONOMIC

Pregnancy may be artificially terminated either to benefit the mother or to prevent the birth of hereditarily diseased offspring. In the opinion of the committee, the maternal indications are at present not sufficiently well defined, and it suggests that more uniform standards are highly desirable. With this object in view an attempt has been made to formulate the medical indications for terminating pregnancy. It is not suggested that the classification is final, but it is intended to form a basis for further discussion. As regards eugenic abortion, the committee is of opinion that the procedure should be considered when there is reasonable certainty that serious hereditary disease will be transmitted to the child.

Induction of abortion for social and economic reasons, of which poverty is the chief, is widely prevalent, and is associated with a relatively high mortality-rate, owing chiefly to the fact that it is often practised by unskilled persons under surgically unclean conditions, with consequent risk of sepsis. The committee has no doubt that the legalisation of abortion under certain conditions for non-medical reasons would go far to solve the problem of criminal abortion, but admits that this is a matter for consideration by the community as a whole and not by the medical profession alone.

It will be seen that the German and English proposals follow closely similar lines; the working of the German law may be expected to furnish valuable information as to the probable effects of legalising abortion in England.

Russia

In Russia the law of abortion is tending towards a restriction of the liberty enjoyed during the last 15 years. On May 26th was issued by the Soviet Government the draft of a new law which will prohibit abortion on health grounds, except where the life or health of a woman is endangered by pregnancy. The penalty suggested for illegal abortion is imprisonment up to two years for a medical practitioner, up to three years for an unqualified operator. There would also be a penalty of two years' imprisonment for any person who compels a woman to undergo an operation for abortion. The consenting woman would pay for a first offence by public censure and for a subsequent offence by a fine up to 300 roubles. The Soviet Union Year Book Press Service, to whom we owe this information, says that the measure has not yet become law, as is generally supposed. It is still a draft, presented to the masses for their consideration, to be passed or amended in accordance with the consensus of public opinion. The Service adds: "When the Soviet Government passed a decree in 1920 granting women the right to abortion it was then regarded as a temporary measure, permissible only so long as the then prevailing economic conditions made the upbringing of children difficult. The position is quite otherwise now. With the increasing prosperity, not only of industrial workers, but of the collective farm peasantry, Soviet women have nothing to fear from larger families. Moreover, the practice of abortion has been found to be injurious to their health. Judging by the numerous letters pouring into the Soviet newspapers and the reports of discussions on the measure in factories and on

[2] Gütt, Rüdin, and Ruttke: Kommentar zum Gesetz zur Verhütung erbkranken Nachwuchses. Second edition. 1936. Same publisher. RM.6.

[3] Brit. Med. Jour., April 25th, 1936, Suppl. p. 231.

collective farms, the draft of the new law is being favourably received. A few objections are voiced now and then in the press. Some women argue that the measure is too sweeping, that abortions should not be entirely prohibited, but should be allowed in exceptional cases, such as when a woman engages in a long course of study."

The proposed measure is not confined to the limitation of abortion. It contains a number of proposals designed to protect mothers and children, such as increased grants for maternity, allowances for families of over seven, provision of 43,000 more beds in maternity homes, extension of the kindergarten system, and the tightening up of regulations for divorce and payment of alimony.

DIARIES OF LITERARY PATIENTS

IN the view of Dr. Macdonald Critchley,[1] the symptomatology of text-books makes dull reading. He prefers the subjective descriptions of men of letters and quotes from "La Doulou," by Alphonse Daudet, who suffered from tabes dorsalis. Daudet's account of his sufferings is macabre in the extreme. He writes of lightning pains as "great tracks of flame slashing and lighting up my carcass. . . . The torment of the spiked boot. Rats with sharpened teeth gnawing my toes." The girdle sensation is described as "The cuirass . . . actual armour, cruelly clasping my loins with steel buckles, and tongues of burning coal, sharp as needles. . . ." Daudet realised that the fear of pain is often worse than the pain itself. "It is bearable and yet I cannot endure it. It is the terror of it. . . ." And the egotism of the sick man is well expressed: "Pain is always fresh for him who suffers it, and banal for the onlookers. All get used to it except I." At Lamalou, in Néris, where he underwent a cure, he comments with grim humour on his fellow-sufferers. "The professor . . . I see him putting one foot in front of another, as flat as can be, and staggering; on ice." Finally there is his cynical gibe at the profession: "The doctors are building in Lamalou. They have faith —and what black hats!" That vivid notes by a skilled writer bring home to readers the nature of the subjective aspect of diseases is not to be disputed. No one could fail to be moved, for example, by Barbellion's disease. But whether such gruesome stuff contributes materially to our knowledge of any disease is a different matter.

A LITHOTOMY INSTRUMENT TABLE

Mr. J. LYLE CAMERON, F.R.C.S. Eng., writes: A lithotomy instrument table has been made for me by Messrs. John Bell and Croyden, London, W., similar in design to the Mayo model. It is constructed like a bedside table, rests on three ball-bearing castors, and is adjustable in height from 24–40 in. to suit the convenience of the surgeon. The tray is 30 in. long and limited to a width of 9 in. so as not to obstruct the surgeon's access to the field of operation when it is placed transversely in front of him. This table is especially designed to facilitate all operations performed in the lithotomy position, such as those on the vulva, vagina, and rectum. Furthermore, it affords a very convenient left hand instrument tray if placed across the patient's chest, behind the anæsthetist's screen, when the Trendelenburg position is employed.

[1] The Symptomatology of Tabes (as illustrated by the diary of Alphonse Daudet). K.C.H. Gazette, April, 1936.

BUCHANAN HOSPITAL, ST. LEONARDS.—On June 6th the new nurses' home at this hospital was opened by Lady Willingdon. It has been erected at a cost of £5700, and much of the furniture has been given by friends of the institution. It will accommodate 26 nurses and 2 sisters.

Appointments

BARR, BESSIE, M.B. Glasg., has been appointed Resident Anæsthetist at the Stobhill Hospital, Glasgow.

HOWELL, T. E., M.R.C.S. Eng., Pathologist to the Evelina Hospital, London.

SHARP, B. BUCKLEY, M.D., M.R.C.P. Lond., Hon. Consulting Physician to Acton Hospital.

Certifying Surgeon under the Factory and Workshop Acts: Dr. W. HUNT (Carlton District, Notts).

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, June 16th.—5.30 P.M. General Meeting of Fellows.

THURSDAY,

Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. H. MacCormac: 1. Ultra-violet Light—Modified Technique. 2. Mycosis Fungoides. Dr. Hugh Gordon: 3. Acanthosis Nigricans. Dr. J. D. Rolleston: 4. Mongolian Blue Patch.

FRIDAY,

Obstetrics and Gynæcology. 8 P.M. Dr. A. Stewart Wilson: Two Cases of Full-time Ectopic Pregnancy Delivered, One by the Vaginal Route, and One Abdominally. Prof. J. M. Munro Kerr: Some Points in the Technique of Cæsarean Section. Dr. W. M. Feldman: Natural or Physiological Contraception.

EUGENICS SOCIETY.

TUESDAY, June 16th.—5.15 P.M. (Rooms of the Linnean Society, Burlington House, Piccadilly), Mr. R. B. Cattell: Is National Intelligence Declining?

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.

THURSDAY, June 18th.—8.15 P.M., Annual General Meeting. 8.30 P.M., Dr. Cecil J. Hackett: Boomerang Legs and Yaws in Australian Aborigines.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

MONDAY, June 15th.—5 P.M. (1, Wimpole-street, W.), Prof. John H. Stokes (Philadelphia): The Control of Syphilis: A Critical Examination of Some of its Problems. (Prosser White Oration.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

INSTITUTE OF CHILD PSYCHOLOGY, 26, Warwick-avenue, W.

WEDNESDAY, June 17th.—6.15 P.M., Prof. H. R. Hamley: Character and Education. 8.15 P.M., Mr. H. W. S. Wright: Character and Citizenship.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY, June 15th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Mr. Victor Bonney: Carcinoma of Uterus.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).

THURSDAY.—11.30 A.M., Col. L. W. Harrison: The Treatment of Syphilis. 2 P.M., Prof. J. C. Windeyer (Sydney): Diagnosis and Treatment of Some Common Obstetrical Abnormalities. 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases.

FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynæcological Pathology.

Daily, 10 A.M. to 4 P.M., Medical clinics, surgical clinics or operations, obstetrics and gynæcological clinics or operations, and refresher course.

SOUTH-WEST POST-GRADUATE ASSOCIATION.

WEDNESDAY, June 17th.—3 P.M., Visit to Glaxo Laboratories, Greenford, Middlesex.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 15th, to SUNDAY, June 21st.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Afternoon M.R.C.P. course in neurology and psychopathology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—BROMPTON HOSPITAL, S.W. Afternoon M.R.C.P. course in chest diseases.—PARK HOSPITAL, Hither Green, S.E. Sat. and Sun., course in infectious diseases.—Courses are open only to members.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, June 17th.—2 P.M., Dr. Donald Paterson: Abdominal Tuberculosis. 3 P.M., Dr. A. Signy: Milk as a Vehicle of Infection.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

UNIVERSITY OF BIRMINGHAM.

TUESDAY, June 16th.—3.30 P.M. (General Hospital), Dr. T. L. Hardy: The Diagnosis and Treatment of Functional Disorders of the Colon.

FRIDAY.—3.30 P.M. (Queen's Hospital), Dr. A. V. Neale: Demonstration of Surgical Cases.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, June 16th.—4.15 P.M., Dr. T. H. Oliver: Recent Views on the Pituitary.